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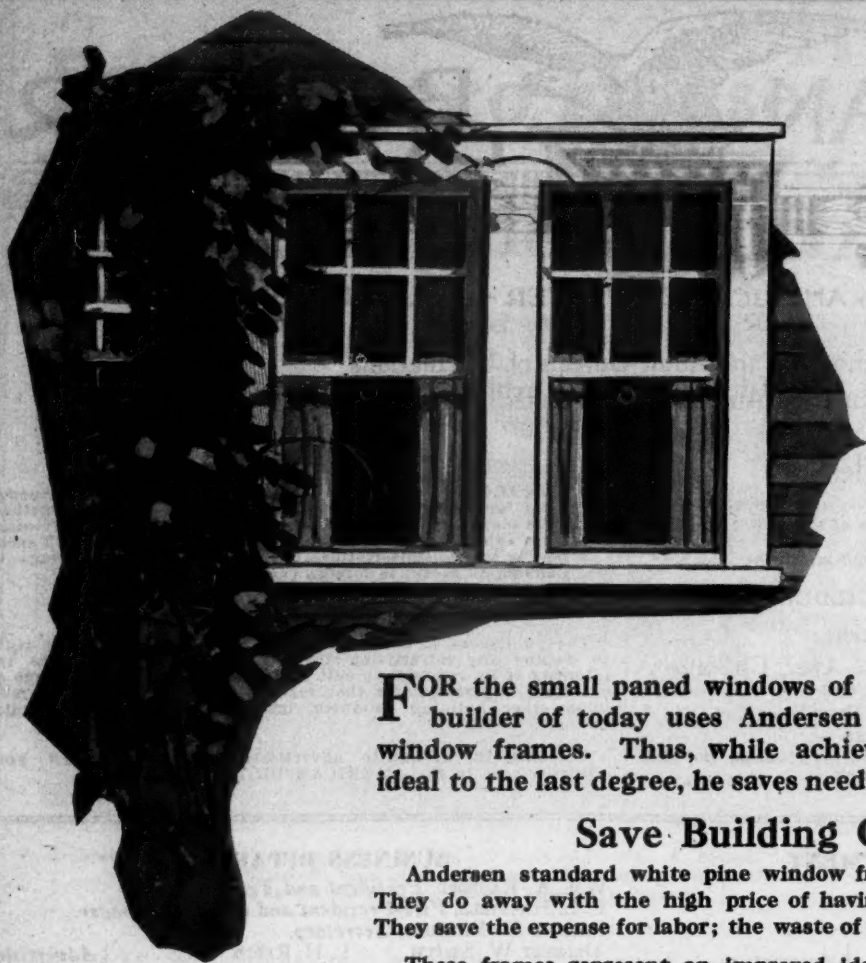
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*In Old
Colonial
Homes*

FOR the small paned windows of the colonial home the builder of today uses Andersen standard white pine window frames. Thus, while achieving his architectural ideal to the last degree, he saves needless expense and delay.

Save Building Costs

Andersen standard white pine window frames save building costs. They do away with the high price of having frames made to order. They save the expense for labor; the waste of lumber; the costly delays.

These frames represent an improved idea in frame construction; to make a complete window frame at the factory, assemble its fifty-seven parts into seven main parts, and ship them in two compact bundles from which a frame can be set up in ten minutes.

They are made in eleven standard sizes, with interchangeable widths and heights to make 121 sizes of two-light window frames as needed, from the wee attic window to the broad living room bay. No matter what the style of the city or farm building under construction, there is a suitable Andersen Frame all ready for its windows.

Send For This Book

We have prepared for builders a book showing how Andersen window and door frames cut building costs and save delays. Upon request, we will gladly send you a copy without charge.

Andersen Lumber Company

Frame Manufacturers

Dept. A-1

South Stillwater, Minn.



COLORADO STATE
TEACHERS COLLEGE
Greeley, Colo.

Andersen
FRAMES

Short Talks by the Editor

Greetings for the New Year

NINETEEN TWENTY-TWO is here. We don't doubt but that the whole world is glad of it. While 1921 marked many worthy achievements, it is with a feeling of profound relief that we view it in retrospect rather than in prospect. We have passed a very trying milestone and many of the difficulties, embarrassments, and gloomy reactions that inevitably follow a war, have been left behind. May they rest in peaceful oblivion!

We always look forward with hope to the New Year. This time more than ever because it should bring with it many things that will make us all happy. Of this much we are sure. Unless something absolutely unforeseen should occur, the world will be at peace for ten years. At least during that time millions will be saved for the people. That is something to appreciate when we consider the present status of taxes.

Business will continue to improve, now that the trying period is over. Renewed friendly relations between nations will remove much of the old doubt and suspicion that have gripped the minds of peoples for the last decade, and it is only natural to expect foreign trade to prosper and foreign exchange to approach normal.

That there will be more building is a certainty. Even during the last few months of the old year was this fact apparent. There is every reason to believe that 1922 will stand out as a banner year, not only because it marked the resumption of healthy business and trade but because it breaks all records in building activity.

Make 1922 the greatest building year in history! May you share in the prosperity it brings!



Encouraging Indications

THERE was a decided increase in the construction of dwelling houses in this country during the first ten months of 1921. This is the information obtained by the Civic Development Department of the Chamber of Commerce.

This report is quite encouraging, for it indicates that the home is at last getting the attention it has needed for some time. In the days of the industrial boom after the war, factories were built and homes neglected; but now it seems the pendulum has swung back to the point where homes again take the lead.

Construction figures furnished by forty-four important cities show that during the period from January to October of last year about \$603,000,000 went into new construction while during all of 1920, the total was only \$8,000,000 more.

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Protecting the Cement Buying Public

MEMBERSHIP in the Portland Cement Association hereafter will be "contingent upon member's product meeting the standard specifications for portland cement adopted by the United States Government and the Society for Testing Materials."

This is the striking amendment to the constitution of that association passed at its recent convention.

Engineers, architects and contractors who are continually handling cement and are familiar with the high standards exacted by the agencies mentioned above will receive this action as the greatest advance steps taken by the industry.

It is designed primarily to protect the cement-buying public, altho the association is not concerned with commercial relations of its members to their patrons. This action will certainly help to keep the quality of portland cement on a high plane and insure its proper use by the consuming public.



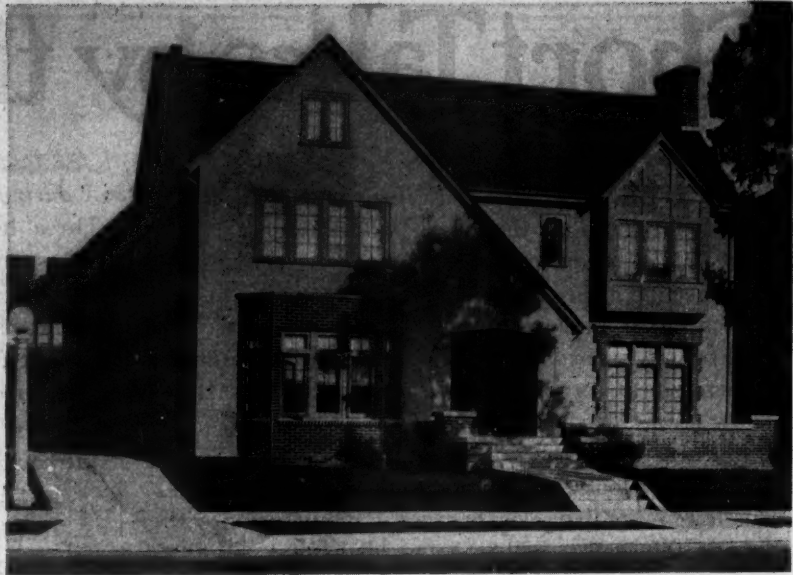
"In Time of Peace, Prepare for War"

SENATOR KENYON believes there is a lesson to be learned from our recent business depression and unemployment crisis and seeks to apply it thru a new bill which he has introduced in the Senate.

The bill in main provides that a large percentage of the public works and projects of the United States be undertaken during a period of major industrial depression and unemployment when labor and capital are not fully employed in private industry, and that smaller percentage of such works and projects be undertaken during a period when private industry is active and competing for the same men and material with resulting business strain.

This bill is vitally important to those engaged in construction as it paves the way for continuous activity in that field despite prevailing conditions. It is only natural during business prosperity that much building will go on, especially homes and factories. Builders are assured of their share of work. And should there be a period of depression under this bill the builder would not have to worry, for then public improvements of all kinds would be pushed. From our viewpoint, then, it has double-barreled value.

Camouflage Apartments



Apartment House Disguised in Garb of Old English Manor House.

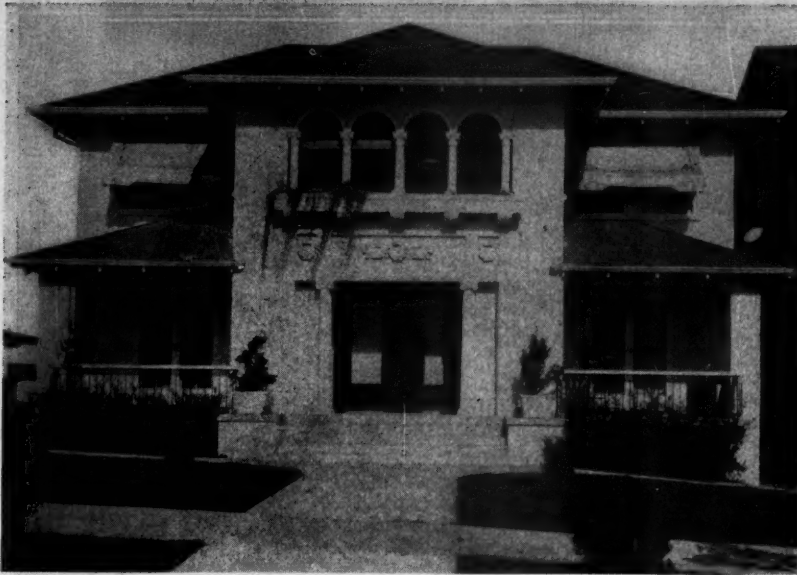
WHENEVER an apartment building is proposed for a residential section, there is an immediate protest from the homeowners in that district because, as they say, and with good cause, the big building will throw the whole building scheme out of harmony. This has been one of the big arguments in favor of zones.

A solution to this problem has been found however. During the war the art of camouflage was developed

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No Violation of Building Lines or Residence Restrictions Here, Altho It Is a Bona Fide Apartment Building.



Gaining the
Real
Home
Atmosphere

To All Appearances an Attractive Residence—It Really Contains Four Apartments.



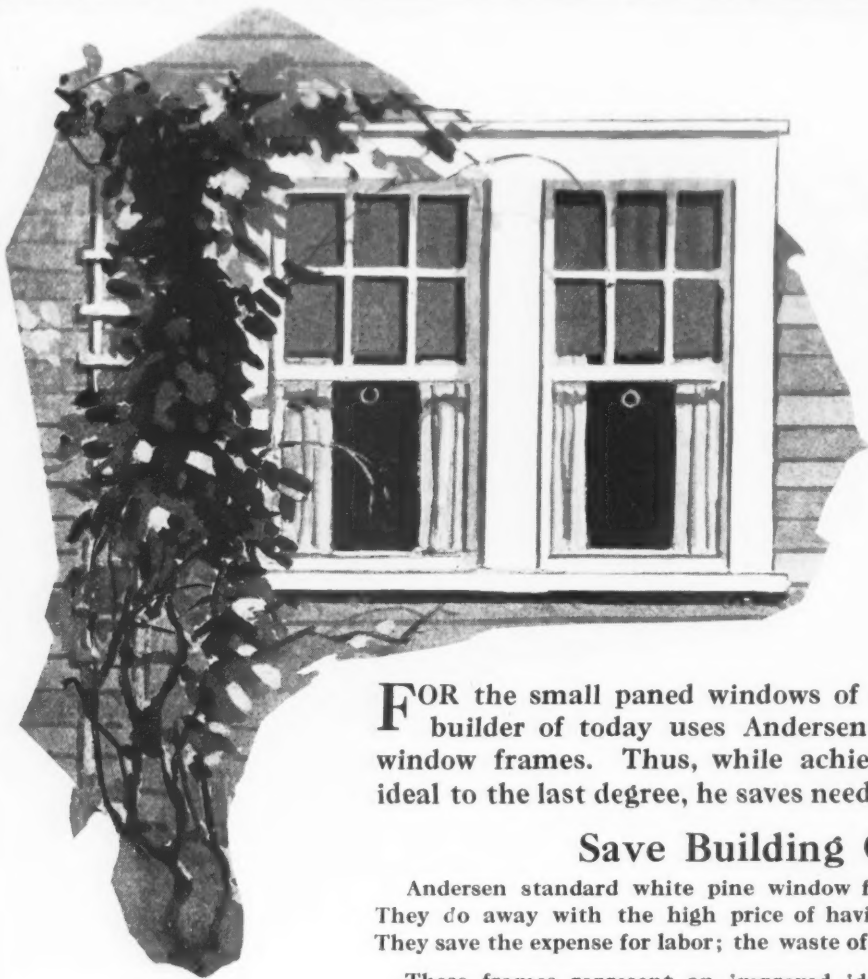
We Have Seen Many Bungalows Like This, but They Did Not Have Three Apartments.

and Colonial.

Apartment buildings have become a necessity in the cities because of the increasing population, and it seems that this method of camouflaging them will not only remove the disagreeable feature which has heretofore made them objectionable in good neighborhoods but make them even more attractive from a renting standpoint. If the people in the city cannot have their own home, they at least like to "believe" they have.



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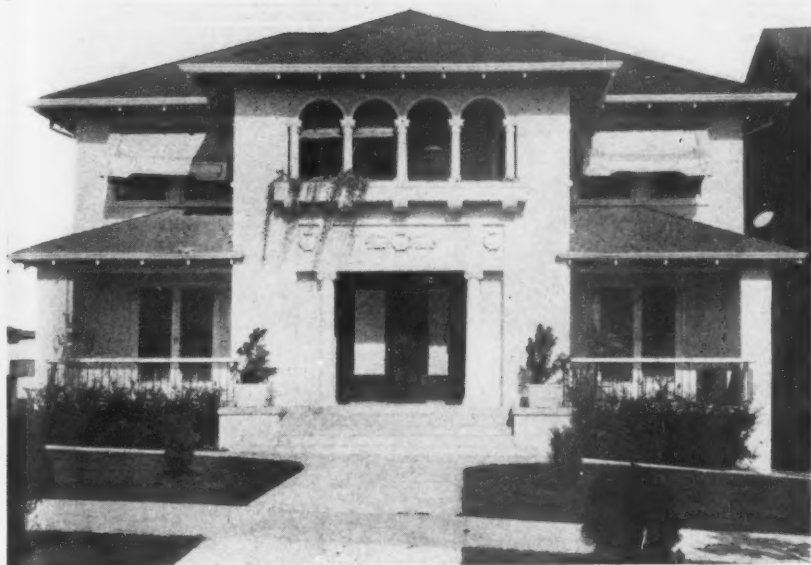
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Well-Arched Kitchen and Breakfast Room with Many Built-in Conveniences.

The Rooms in the House

FOURTH ARTICLE OF SERIES ON ARRANGEMENT, TRIM AND DECORATION OF VARIOUS ROOMS IN THE HOME—

3—The Kitchen and Breakfast Room

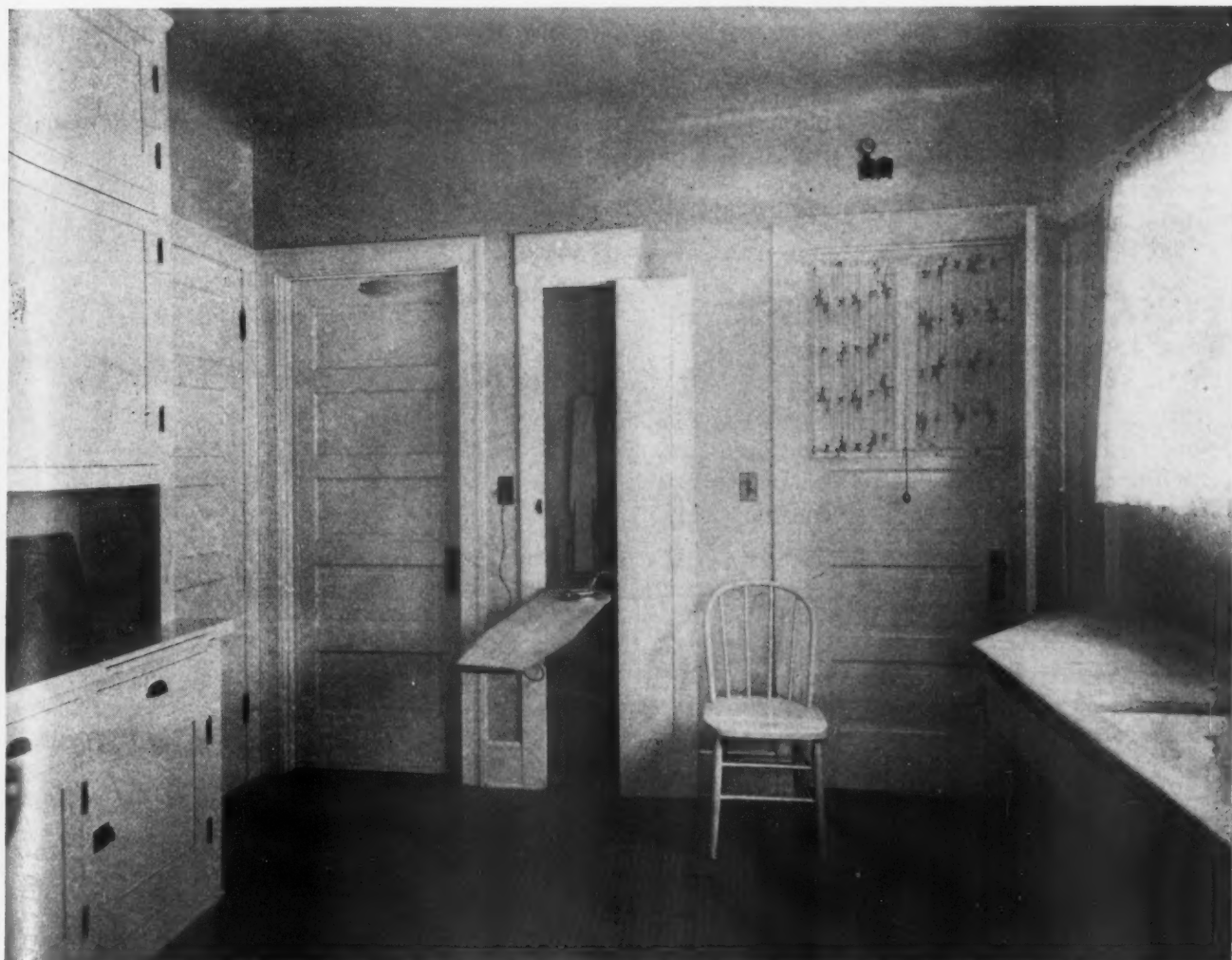
By Wm. B. Reedy

THE kitchen is the food factory of the home. If architects, manufacturers, and contractors think it well worth their time and money to devise means and ways whereby they can make the modern industrial factory as cheerful, healthful, and inspiring as possible for the workers who spend their days in it, why should they not be willing to give nearly as much time and attention to the study of the kitchen in the home, which is the workshop of the housewife?

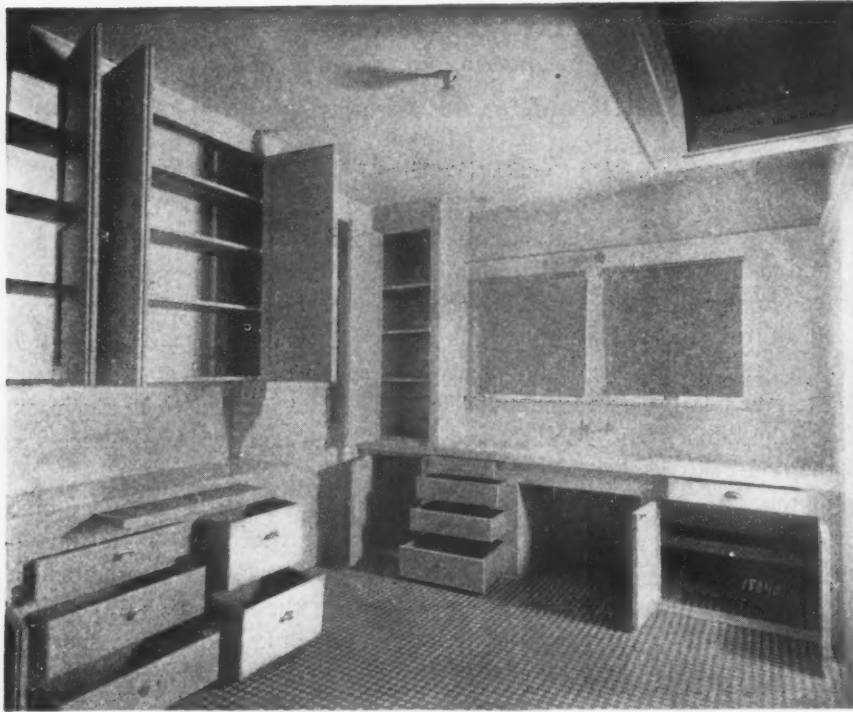
Happily to say, many of them are, but there are as many more who have not yet fully realized the importance of this room in the home and the commanding part it plays in determining the charm of the home. We of this generation can all well remember the first automobile or gas buggy as it was then called, when it made its appearance on the streets. It was unsightly, ungainly, and difficult to handle. Quite a contrast from the swiftly moving, efficient, and beautiful car of the present day.

Well, just about twenty years ago the kitchen was a great big awkward, barn-like room that was terrifying in its ability to cause work for the housewife or help. The ceilings were high, the room was large, there was plenty of floor and wall space to be kept clean and plenty of ground to be covered from sink to range and back, and from kitchen to dining room. It was accepted by the tired housewife as a necessary evil.

But like the progress in the manufacture of automobiles has come a definite advancement in the art of building homes. In a factory, no superintendent would think of performing the same task 1,000 times a year without searching high and low for a short cut or some device that would save labor. That is just the reason why no housewife should be expected to prepare 1,000 meals in the same old way each year without having the full benefit of the building profession to lighten her task.



Small but Complete Kitchen with Built-In Ironing Board, Food and Utensil Cupboard. The Sink Has Been Placed Under the Window to Insure Plenty of Natural Light.



Unusually Well Provided with Storage Facilities. The Open Drawers and Shelves Show How Built-In Furniture Saves Space in This Kitchen. Note the Arrangement on Either Side of the Sink.

The architects and builders have responded nobly to this appeal, and today the new kitchen is a far cry from the old kitchen of twenty years ago.

Much has been accomplished and more can be done to lessen the drudgery of this room by the proper placing of the furniture and equipment. In the first place, the size of the kitchen has been cut in half or more. The average room today is 10 by 10 feet where it used to be at least 15 by 15 feet, a saving of about 125 square feet. Figure out for yourself the saving in construction costs—and the saving of steps for the housewife. This has been a revolutionary improvement.

What has made it possible? The introduction of permanent built-in fixtures. The same facilities are afforded in the small kitchen as in the large one for now instead of a separate sink, separate work table and cupboards, they have been combined in one piece. The design of this combination may vary but they all embody the same principle of labor saving and space saving. In some kitchens this idea takes the form of a work table containing a sink and flanked on each side by cupboards or china closets, in others a kitchen cabinet. These cupboards may extend from floor to ceiling or only part way. In all cases it is advisable to leave the plumbing under the sink open in case of trouble.

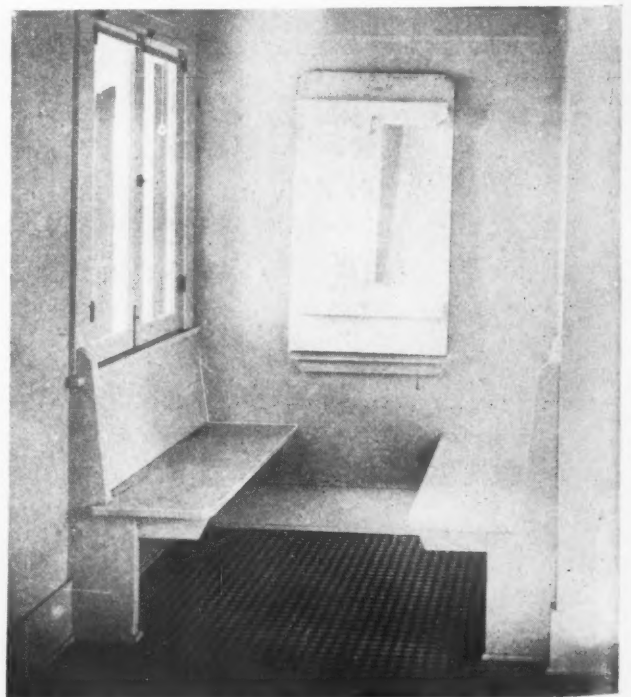
The kitchen sink and range are the two most important pieces of equipment in the kitchen. Because they are both used continuously in the preparation of meals they should be placed as near each other as possible. The logical place for the sink is under a window so that the person working over the sink can

get plenty of natural light. The matter of drain boards is an important one and offers wide variety such as porcelain, slate, or tile.

In locating the range, which in recent years has come to be considered a part of the house, various methods are used for providing ventilation. The best place is against the inside wall near the house flue. If a hood is desired over the stove it can be built as shown in one of the illustrations or the stove can be placed in an alcove off the kitchen.

The other important cog in this small food factory is the storage place for foods and utensils. This may be as we have said above a combination built-in cabinet and sink and work table, in this case no other furniture is needed, but, very often, it is a separate kitchen cabinet which embodies the work

bench but does not include a sink. If this is the furniture used, the kitchen cabinet should be placed in a position near the range so that the mixing of the food preparatory to cooking will not be too far away from the stove. The successful kitchen is so arranged as to have each step count, from the time the food comes out of the cupboard to the stove where it is cooked, then to the dining room where it is served, back to the sink where the dishes are washed and to the cabinet where they are put away.



Breakfast Nook Off Kitchen Equipped with Permanent Furniture. This Room Serves as a Handy Supplement to the Dining Room for Light Meals.

The architect and builder must remember many of these essential points when planning a kitchen in the small home that will only have 100 square feet of floor space. He cannot afford to waste any space nor can he omit any piece of equipment that the housewife needs.

Now in many homes the breakfast nook, as it is called, is quite convenient and because it is so closely bound up with kitchen plans we are including a discussion of it in this article. "Nook" properly describes this room because it is only a small alcove either off the kitchen or dining room, a sort of dining room substitute where the less important meals such as breakfast and lunch can be served without much fuss or work. In the real small home it takes the place of the dining room because it takes up about one-fourth the space and still can accommodate three or four people. For the large house it is a very convenient supplement where formality can be dispensed with.

The furniture in this breakfast room consists of two seats and a table which fit a space not more than 6 feet wide. The table top is usually about 2 feet 6 inches by 4 feet 6 inches and is about 2 feet 6 inches high. The seats are about 1½ feet wide, 4 feet long and 3 feet 6 inches high to the top of the back. They



Another Combination Kitchen and Breakfast Nook, Showing Half Partition Arrangement. The Convenience of This Room for Serving Informal Meals Is Readily Seen. It Saves the Housewife.

are fastened to the wall. In most cases these fixtures are of a very plain design. The room may not be separated by a full length partition but by a half partition which can contain a china closet or some other cabinet. One window gives plenty of light.

In the modern kitchen arrangement there is no need for a pantry which occupies space that costs money. Cupboards take care of the materials which were formerly kept in the pantry. So instead of having a large kitchen occupying over 200 square feet of space and a pantry occupying another 50, the modern home has the same efficiency for a great deal less work and the use of a special dining room occupying in all only about 150 square feet. While cold practical cost considerations have been instrumental, we cannot deny the tremendous effect of the sentimental appeal, lighten the work of the housewife. It is slowly but surely shaping construction methods and practices to its own needs.



WASHINGTON has been the leading state in lumber production since 1905. From 1900 to 1905 Wisconsin was first; in 1920 Wisconsin was tenth.

The combined production of Douglas Fir and Western yellow pine, which in 1919 was less than 60 per cent of the amount of Southern yellow pine produced and in 1909 was only about 39 per cent, in 1920 became 83 per cent.

Of the principal hardwoods produced in 1920 tupelo shows the greatest gain in production over 1919—25 per cent. Elm production increased 16 per cent and oak decreased 8 per cent compared to 1919 production.



Broom Closet and Other Space Saving Features in Modern Kitchen. Note the Hood Over Stove to Keep Dirt and Gases from Spoiling Kitchen Walls.

Advertising Basis of Successful Lumber Business

HOW CENTURY LUMBER CO., DES MOINES, IOWA, IS GOING AFTER BUSINESS AND BECOMING ONE OF THE MOST PROGRESSIVE CONCERNS IN COUNTRY

"EXTRAVAGANCE is a thing of the past and it is again necessary to get out into the field and fight for business. We're going to help keep ourselves up by advertising."

These words, voiced by Edward Weitz, secretary of the Century Lumber Co., Des Moines, Ia., reveal the spirit behind the concern which has become a factor in the wholesale and retail lumber business and one of the most modern plants in the country.

His concern believes in advertising its products and on this belief have built up a very successful business. Thruout Des Moines large, colorful, and striking billboard paintings arrest the eye of the passerby and call his attention to



Main Yards of Century Lumber Co. This Building Is 305 Feet Long and Has a Capacity of 6,000,000 Feet. It Is Built of Concrete and Steel and Is Three Stories High.



Interior View of Large Warehouse of Century Lumber Company. There are Three Tiers of Lumber. Trucks Can Drive Up to the Bin and Be Loaded Without Delay.

the building service, the home suggestions and the materials which the Century Lumber Co. have to offer. Some of these billboard advertisements are shown here. These are unusual methods for a retail lumber company to use but very productive according to results. Local papers are used for advertising and thousands of special advertising circulars and form letters

are sent out direct by mail. In addition every bit of instructive literature published by the manufacturers whose products are sold by the Century company are distributed.

Recently this firm started a series of advertisements covering such subjects as repair work, new homes, remodeling of old homes, garages, interior wood finishes and so on. In each of these advertisements mention is made of the fact that they can supply the prospect with interesting booklets. All of the leads developed from this local advertising are followed very closely not only by letters but by direct solicitation.



Fleet of Trucks Which Have Made Century Service in Iowa



Large Colored Billboard Advertisement Which Is One of the Effective Mediums Used by Lumber Concerns to Stimulate Business.



Another One of These Billboard Advertisements Which Dot the City of Des Moines and Neighboring Towns. This Company Believes in Advertising Effectively.

The effects of this progressive spirit in running the lumber business is quite evident. To take care of their large trade the Century Lumber Co. has a modern three-story office, show rooms and millwork building and a supply yard storage shed which is one of the most unique and efficient in the country and one well worth duplicating.

In the show rooms of the main building a miniature model of this warehouse is shown where it can be studied by visitors. In this show room practically every kind of material sold by the company is also on display. In the model, electric toy trains operate on a small track pulling loaded freight cars. This display has attracted much attention and has proved to be of considerable advertising value.

The large warehouse itself is an enormous building, 505 feet long and 60 feet wide, with a capacity for 6,000,000 feet. It is built as fireproof as possible, being of steel and concrete construction, covered by 30,000 square feet of gravel roofing. This roof is laid on a roof of 3 inches of

concrete. Steel I beams and channels are used for girder's, posts and roof trusses.

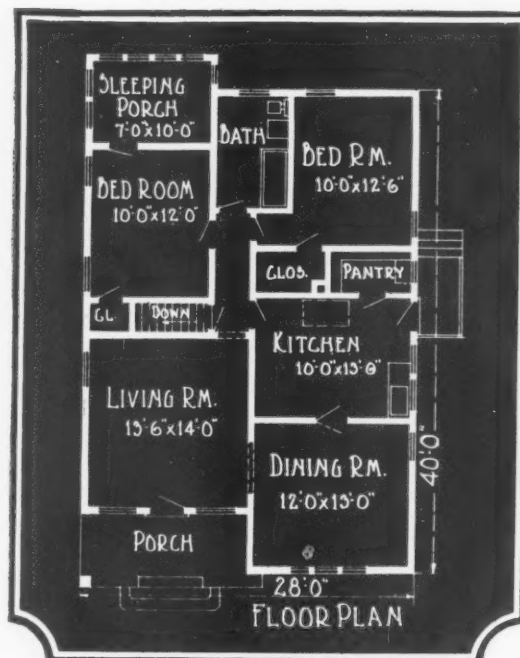
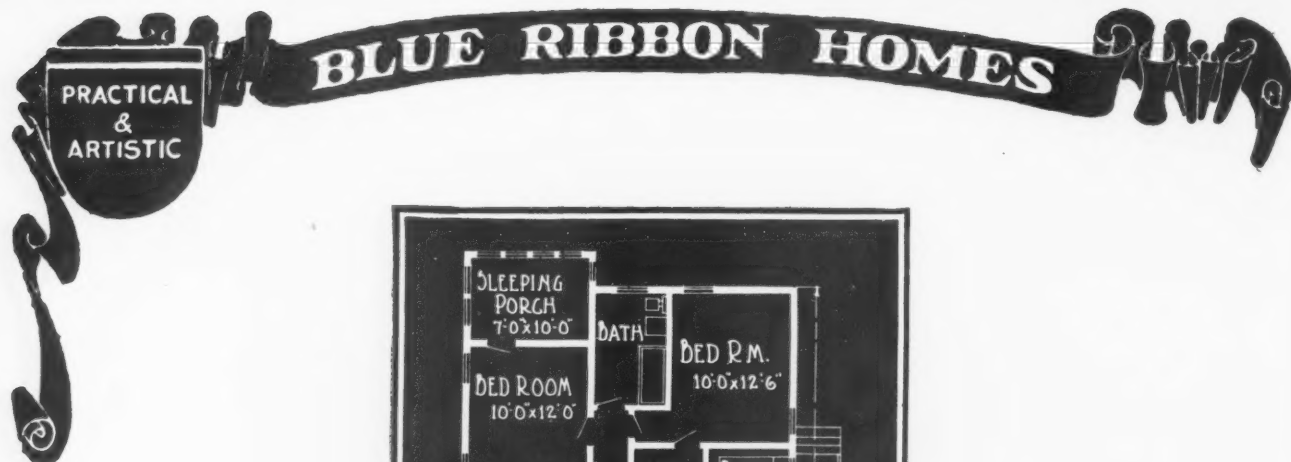
The interior of the warehouse has been very efficiently arranged as can be seen in the illustration.



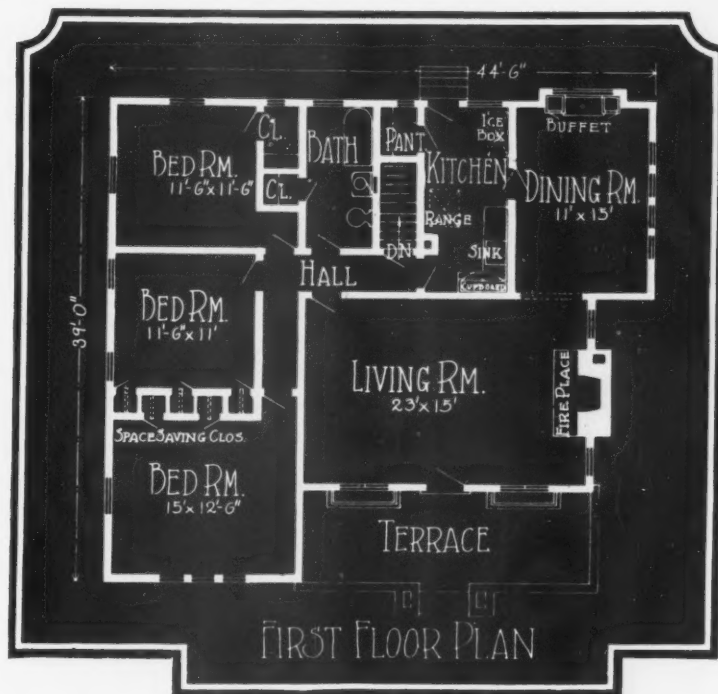
View of Busy Office of Century Lumber Company in Main Office Building. There Is an Elaborate Show Room in This Building for the Display of Their Products.

The structure is three stories high, providing room for three tiers for the storage of all lengths and kinds of lumber. Down the center a broad driveway permits trucks and wagons to load up next to the variety to be delivered. As the second and third tiers an iron balcony extends along each side so that stock can be easily reached up there. Electric lights give plenty of light to the building in dark weather, while the skylight along either side of the center ridge on the roof gives plenty of natural daylight at other times.





SMALL, MODEST BUNGALOW OF ECONOMICAL DESIGN. This a "homey" little home, free from any expensive frills and just the house for the family of meager pocketbook. Contractors will have many calls for this type of inexpensive dwelling during the coming year. It has all the comforts of a large home and a very charming exterior design which gives an inviting impression. The construction is frame, with a small, recessed front porch and concrete steps. It occupies a very small site, 28 by 40 feet, yet contains five, good-sized, comfortable rooms and sleeping porch. There is a living room, 13 feet 6 inches by 14 feet; dining room, 12 by 13 feet; small compact kitchen with pantry, and two bedrooms, 10 by 12 feet. The living rooms have been grouped toward the front of the house with the bedrooms and bath in the rear away from the noise.



HOME PATTERN DELIGHTFULLY DESIGNED AND TREATED. No! This is not a doll house, altho it looks quite as pretty. It is a substantial little home of frame set on a firm concrete foundation covered by a waterproof composition roof. Much of the attractive effect is gained by the casement windows facing small balconies with artistic iron railings of the Georgian type. The front entrance is also a charming feature and one that should interest builders because of its simple elegance of style. Within there are six well proportioned rooms, of which the living room is the largest, 23 by 15 feet. It has a large fireplace and plenty of window space. The dining room is very conveniently located while the three bedrooms are placed on the opposite side of the house. They have been equipped with space-saving closets. The curved driveway to the garage in the rear is rather unique. This house is 44 feet 6 inches by 39 feet.

Handsome Bank Building for Growing Town

SENSATIONAL ILLINOIS TOWN BUILDS STRUCTURE THAT WOULD BE WORTHY OF LARGE CITY

By Herbert C. Crocker

A BANKING house, planned to provide the maximum efficiency from every foot of floor space and with all of the conveniences of the big city bank is shown in the accompanying illustration and drawings. It is an excellent arrangement for an institution employing eight or ten persons. The building is at Wood River, Ill. Recent government reports shows the city the fastest growing in the United States and the bank is designed to take care of future business.

The style of architecture follows closely the lines of a modified Greek temple. The building is as near burglar proof and fireproof as possible. It is of brick construction, having terra cotta trimmings and half columns for ornamenting the walls. The inside dimensions of the building are 27 by 59 feet.

The general appearance is that of a one-story building, but in reality it is virtually two stories. This

is made possible thru a mezzanine or balcony, the additional space being occupied by the accounting department. The safety deposit vaults, as well as the storage space and heating plant are located in the basement.

The main floor plans show exactly the arrangement of the the interior, the placing of the desks and chairs, carefully drawn to scale and the sittings have been found satisfactory.

The cashier has a public and private office in one corner of the main floor. From them he has access to the cages, vault and clerical force on the mezzanine, in fact, every part of the building and basement without passing thru the public lobby. If desired the inner doors may be built of steel, making it more difficult for bandits to reach the vault.

The bank has four cages, three of the same size and the fourth is slightly larger. Each has a suitable



First State Savings Bank, Wood River, Illinois, the Miracle Town of the Last Decade. This Modern Substantial Building Is in Keeping with the Progressive Spirit That Dominates That Community. They Build Well and Fast. It Was Designed by James A. Craine, Architect, St. Louis, Mo.

work shelf with a series of cage doors. There is a passage at the rear of the row of cases as an avenue to the vault, also leading to an interior stairway to the mezzanine floor. The clerks also have access to a toilet room.

The directors' room is 12 by 17 feet, amply large for the ordinary number carrying on the business. A fireplace is the principal decoration of the room.

Provision for privacy of ladies visiting the bank are made. They have a nice side room with a desk, toilet and easy chairs for their convenience. This feature has been found a very popular one among the ladies.

There is a great deal of space on the mezzanine floor. The vault is high enough to permit storage space for valuable records. The floor also has a closet for the stock of unused books, etc. Clerks on the floor are provided with toilet facilities.

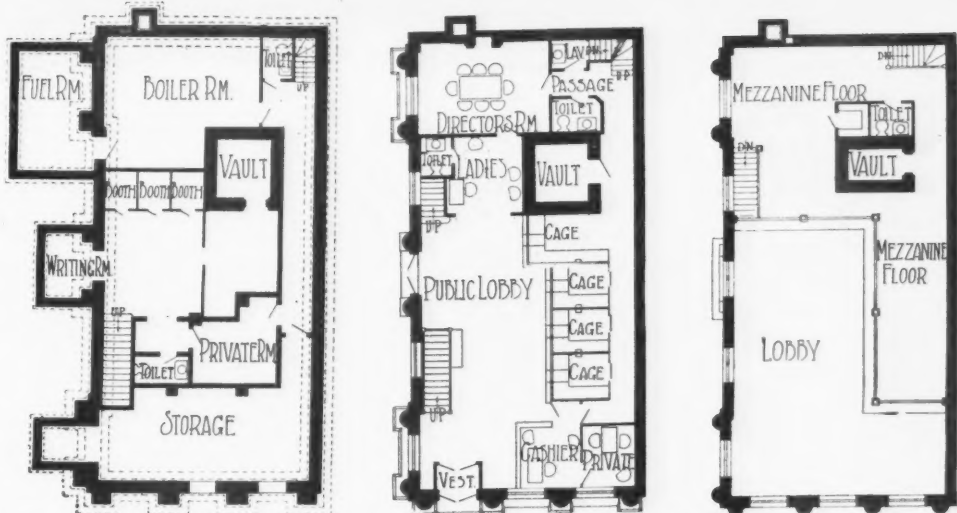
The vaults in the basement are very much unlike those found in the small city bank. A double protection is provided. Besides the vault protection the bank has installed a heavy steel fence across the vault room. At night it is securely bolted. Another feature are three booths in which patrons may examine papers in their boxes. Nearby a writing room has been furnished and in it the patrons have access to a typewriter.

The plans provide a private room for stock, a large storage room, the boiler room and coal storage in the basement.

A Worthy Institution

FOR more than 10 years the Forest Products Laboratory at Madison has been studying wood, always with the object of developing its most efficient and economical use. During that period it has amassed a great deal of scientific information of the most practicable application. Great credit is conceded the Laboratory for its research accomplishments but in the final analysis the value of its work must be measured by the extent to which the results of its work are made known and effectively applied by the wood manufacturing industries.

It is well recognized that those in charge of the work at the Laboratory have been endeavoring to remedy this situation as evidenced by the information disseminated currently through trade and technical publications and other means. To develop its dissemination work even to this extent it has been necessary for the Laboratory in certain cases to require co-op-



Basement, Main Floor and Mezzanine Floor Plans of Bank Showing Large Lobby, Cages and Up-to-Date Facilities.

erators to bear the cost of dissemination.

This is a situation which ought not to exist. It is one easily remedied and the remedy lies in a specific appropriation by Congress for the dissemination and application of the Laboratory's results commensurate with its research activities and accomplishments.

The Laboratory should have at Madison an adequate force to prepare all its data of practical application in a form which the business man can readily grasp and apply. The duties of these men should be to carry the information, now available at the Laboratory and being made use of by the relatively few, to the men in the sawmill, or in the lumber yard, or in the wood-using plant. Personal contact, after all, is the most effective means of disseminating practical, scientific information.

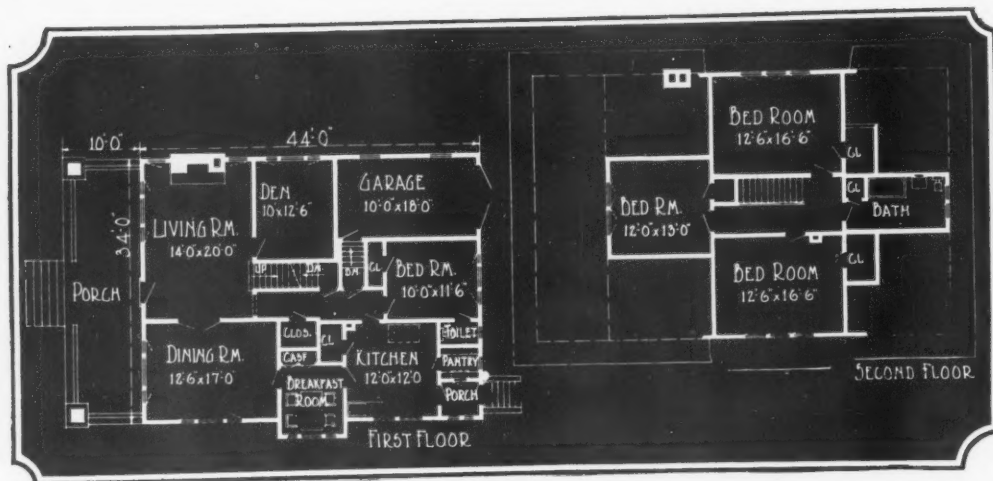
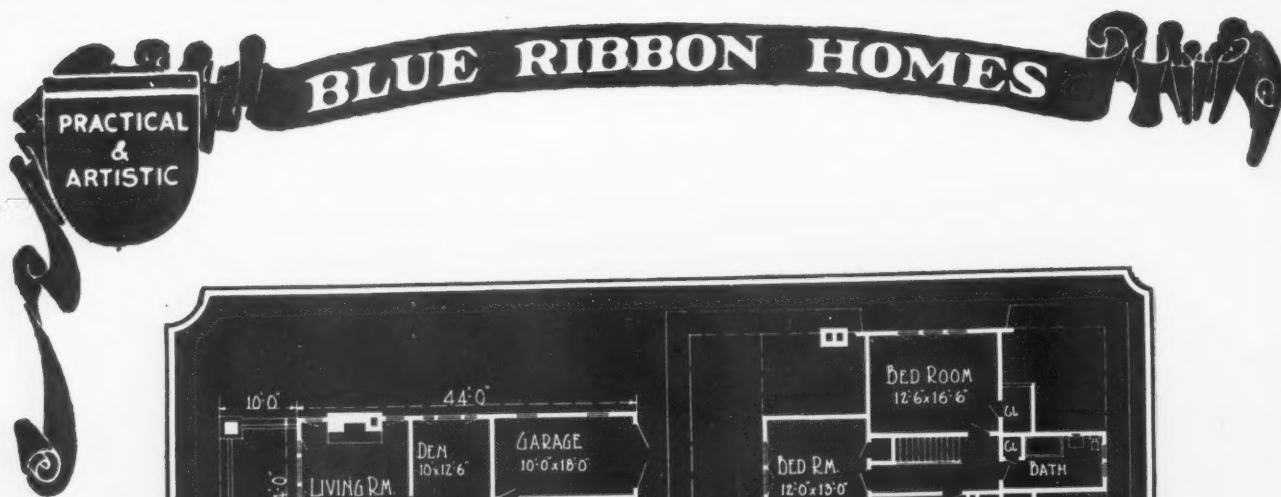
The current annual appropriation for forest products research amounts to \$325,000. This is equivalent to less than 25 cents for every \$1,000 of raw manufactured value for the total annual cut of wood. On the other hand the Department of Agriculture is spending for agricultural research and development \$1.50 for every \$1,000 of value of all agricultural and animal products.

For reasons already stated the Laboratory's appropriation should be increased a minimum of \$100,000.

Number of Persons Paying Taxes on Large Incomes

(Submitted to Senate by Senator Lenroot, who stated that tabulation had been made by Department of Treasury experts.)

| Net Income | Number of Persons paying taxes |
|-----------------------------|--------------------------------|
| \$ 6,000 to \$ 100,000..... | 500,600 |
| 100,000 to 150,000..... | 3,400 |
| 150,000 to 250,000..... | 1,738 |
| 250,000 to 500,000..... | 738 |
| 500,000 to 1,000,000..... | 174 |
| more than 1,000,000..... | 54 |

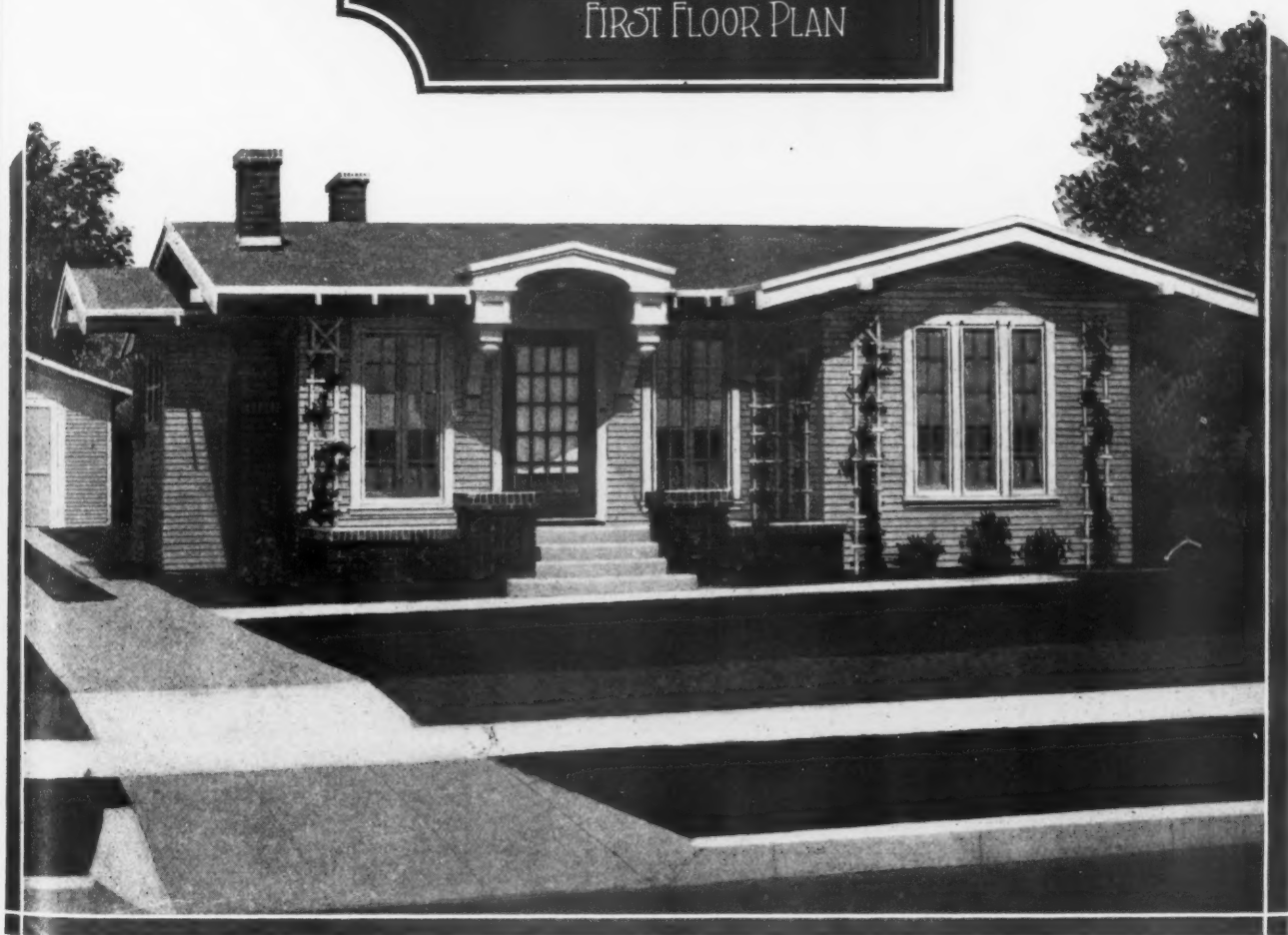
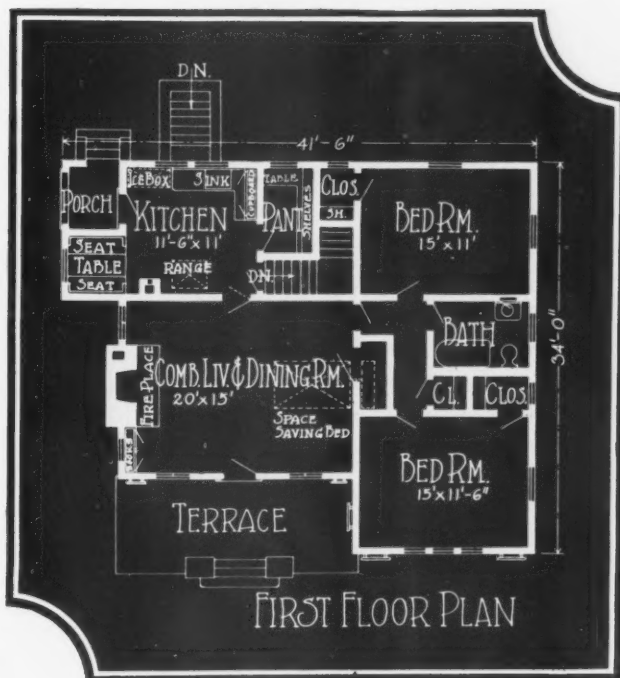


DISTINCTIVE CHARACTER IN THIS DESIGN. Here is an attractive exterior treatment combined with a sense of solid comfort and strength. A broad front porch and wide steps give an impression of spaciousness, hospitality and warm welcome. The handling of the roof and various other small details of trim are worth study. There are seven regular rooms, a den and garage built right in the house. Living room, dining room, kitchen, and one bedroom are on the first floor and three bedrooms are on the second floor. A cozy breakfast nook has been built in between the kitchen and dining room. The feature of the bedrooms on the second floor is the broad expanse of window space in each room, the front room having two pair of casements, and each of the side bedrooms having three pair. The garage which is on the ground level is reached by a short stairway leading from the kitchen. Size 44 by 34 feet.

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BLUE RIBBON HOMES

PRACTICAL
&
ARTISTIC



SMALL HOME DESIGN OF PLEASING APPEARANCE. This little home radiates a distinct feeling of welcome. It is cozy looking, set low on the ground and, altho small in appearance, has plenty of room well divided and arranged. The exterior treatment is well handled, such details as the canopied front entrance, long narrow casement windows, low terrace in front of the door with brick railing, adding immeasurably to the pleasing impression offered by this home. No vestibule has been built in this house, that space being included in a large combination living and dining room, 20 by 15 feet, with a space-saving bed installed for emergency. There are two other bedrooms, and kitchen. The bedrooms and bath have been grouped in one side of the house effectively protected from the disturbing activities of the other rooms. The kitchen has a built-in breakfast room. Size of house, 41 feet 6 inches by 34 feet.

Attractive Dutch Colonial House

SEVEN COMFORTABLE ROOMS, TWO BATHS AND BROAD OPEN PORCH MAKE IT A CHARMING HOME

COMFORT is the ruling factor in the construction of the Colonial home. Each detail emphasizes this quality. Above all, this type of home must be livable and that is why the design itself has such a strong appeal, such a hospitable appearance.

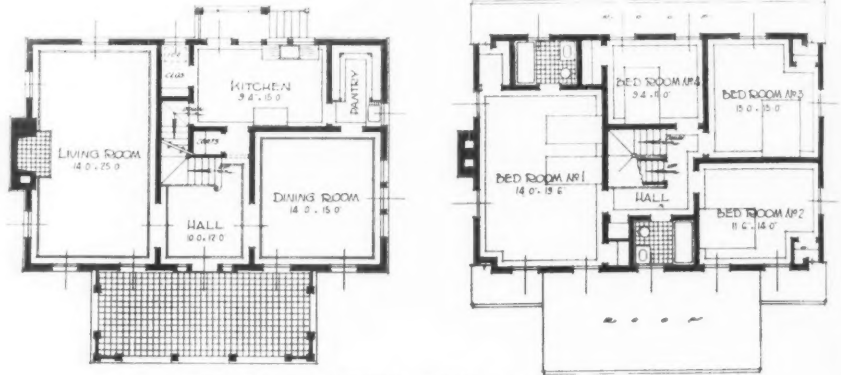
The plan of the charming Dutch Colonial house shown in the accompanying illustration gives a maximum of comfort. It is a substantial home that will satisfy the requirements of a good sized family in reasonable luxury and has the conveniences which are necessary to make a home complete.

The rooms are all of good size and conveniently arranged. The stairs are very compact and well located.

Four bedrooms and two baths give ample accommodations for the average family, while two additional rooms and a bath are provided on the third floor.

The gambrel roof gives the house an attractive exterior and while the eaves are brought down to the first story to make the house appear low, the large dormers on the front and rear give full use of the second floor space. The interiors are carried out in a simple Colonial treatment in harmony with the exterior.

The large stone chimney adds to the attractiveness of the exterior and provides a fine large fireplace in the living room. This house is the home of A. J. Bleeker, Tenafly, New Jersey, and was designed by R. S. Hunter & Bro., architects, New York City.



Floor Plans of Colonial House of Seven Rooms.

A Way of Theirs

"Bills have one queer quality."

"What is it?"

"The more you contract them, the more they expand."



"Here comes a friend of mine. He's a human dynamo."

"Really?"

"Yes, everything he has on is charged."



Charming Colonial Home of Economical Construction. Inexpensive Materials Have Been Used Without Any Appearance of Cheapness. All Waste Space Has Been Eliminated. It Has Seven Rooms and Two Baths and Is 40 by 26 Feet.

Colossal Bridge to Span Hudson River

WORLD'S LARGEST BRIDGE PLANNED TO CONNECT NEW YORK AND NEW JERSEY—STEEL WORK TO BE ENCASED WITH BRONZE TO PREVENT CORROSION

THERE are two outstanding features about the projected bridge between Manhattan and New Jersey across the Hudson River. One is that it will be the largest bridge in the world—the other is, it will be weatherproof.

The Brooklyn Bridge, itself long an engineering marvel, is dwarfed by comparison with the proposed Hudson River bridge. The latter will have a river span of 3,240 feet and auxiliary spans on either side of 1,650 feet each. Probably the most picturesque features are the towers to support the large spans. They will be higher than the Woolworth building, which is the world's highest skyscraper. These towers will be 840 feet high on bases 200 by 400 feet.

The floorway will be built with two decks, 235 feet wide. The upper deck will be wide enough to allow the simultaneous passage of eighteen lines of vehicular traffic, two rapid transit tracks, and two fifteen-foot promenades. The lower deck will carry twelve standard gauge railroad tracks and conduits for cables and pipe lines.

The estimated cost of the bridge is placed at \$100,000,000. The traffic alone is expected to yield

\$45,000,000 during the first year and after ten years average \$60,000,000 annually.

But of particular interest to builders of all kinds is the weatherproof feature which is estimated will save \$400,000 yearly. Engineers in charge of the project have figured this will be saved by resistance to corrosion provided by the bronze coating.

They say: "Its steel work will be so completely enclosed with rain and moisture excluding bronze that the annual cost of repainting, a most serious item in the upkeep of a bridge, will be reduced to a minimum.

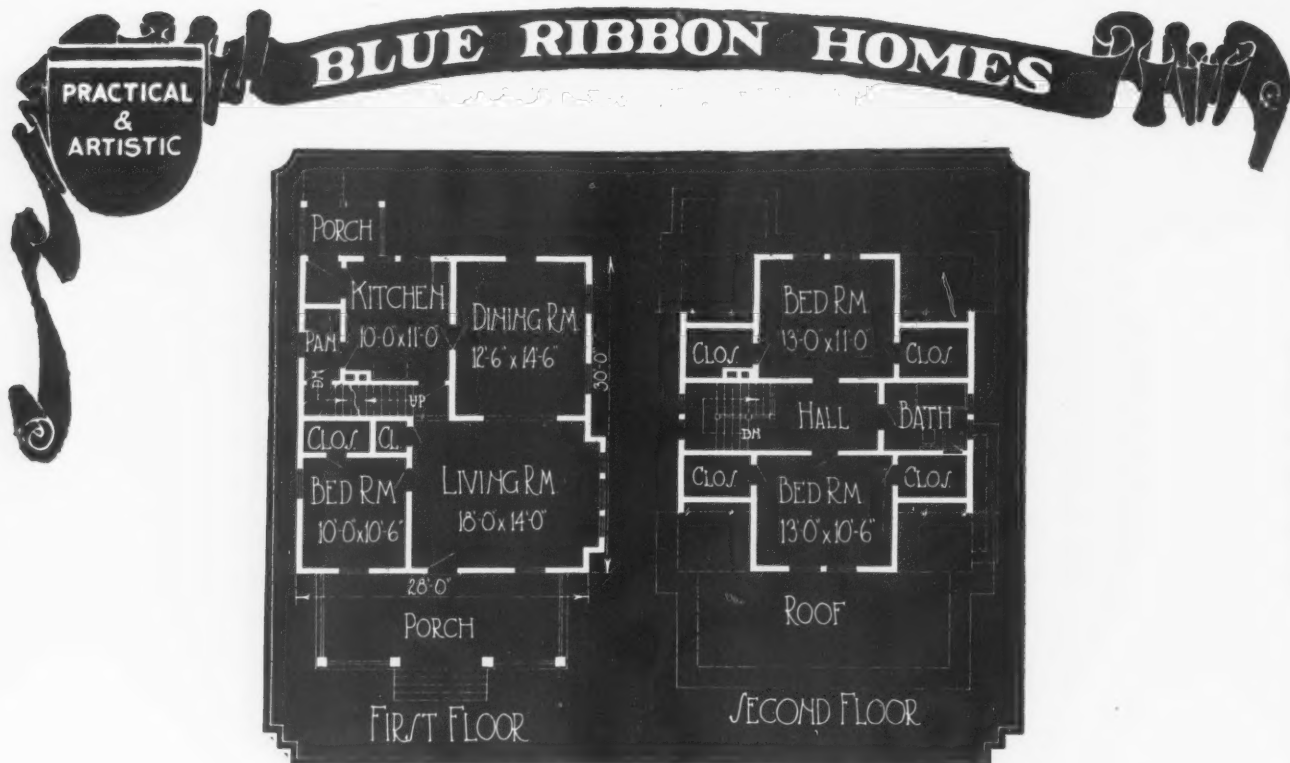
"In the Hudson River bridge there are a pair of suspension trusses or inverted arches spaced 160 feet apart, center to center, each truss consisting of two cables from 60 to 80 feet apart vertically, with vertical panels and diagonal bracing between to supply the stiffening under passing loads. From the two suspension trusses vertical eyebar chains are suspended and carry the double decked floorway.

"Each of the four cables consists of three chains whose links are enormous eyebars, or steel bars with a hole or eye at either end thru which connecting

(Continued to page 83.)

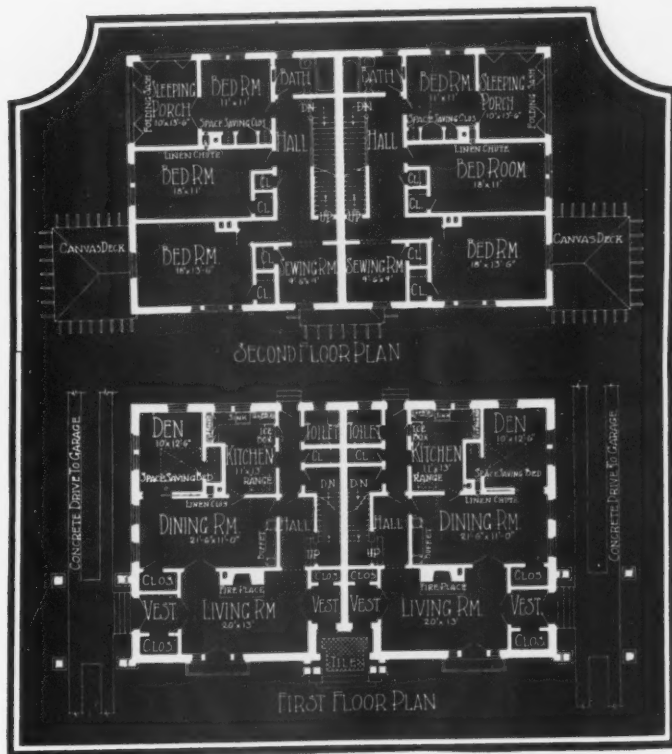
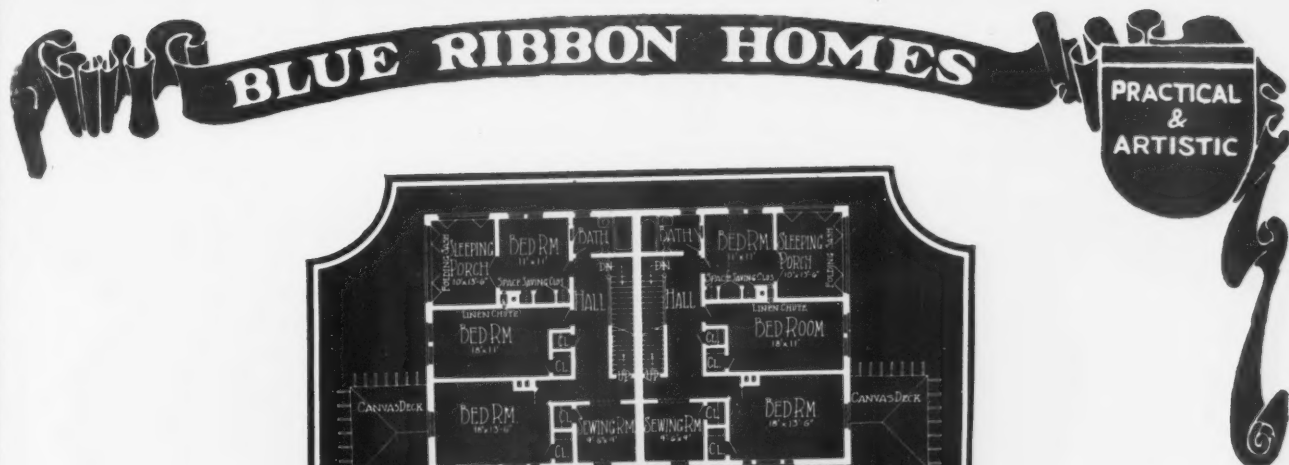


Drawing of Proposed Hudson River Bridge Which Will Be Largest of Its Kind in World. The Central Span Will Be 3,240 Feet Long. The Towers on Each End 840 Feet High. On the New York Side a Skyscraper Will Be Built. All Steelwork Will Be Coated with Bronze.



MODEST HOME OF ECONOMICAL DESIGN. For the thousands, as opposed to the few, this type of home is quite logical. It fits the possibilities of a small but honest pocketbook and offers the comforts of a real home, attractive from without, comfortable within. It is frame construction, set on a rock-faced concrete block foundation with wide open front porch and half story above for two comfortable, light, well-ventilated bedrooms. It is of the square, economical type, 28 by 30 feet, with one regular bay and no unusual additions or decorations. The living room is a large room, 18 by 14 feet with dining room in connection. Conveniently near to the latter room is the small kitchen, 10 by 11 feet. A bedroom also opens into the living room. The floor plan arrangement of this house lends itself very efficiently to a pipeless or pipe furnace. Two bedrooms are provided on the upper floor.

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DOUBLE DUPLEX APARTMENT HOUSE OF PRETENTIOUS DESIGN. This is an unusual design but one that will find favor in many communities where the double house is popular. Moreover, the duplex feature adds the attractions of a home, that is, an "upstairs and down" which many people want. It is very attractively finished in white stucco with rather ornate entrances, side drives and pergola portecocheres. There are entrances to each apartment in front and on the side, the latter being the automobile entrance. There are seven rooms and sleeping porch in each unit, the living room, dining room, kitchen and den being on the lower floor. The living rooms are 20 by 13 feet each, with fireplace centrally located in inside wall. A space-saving bed is installed in the den in case an extra bedroom is needed. Each unit is 32 by 40 feet 6 inches with a 12-inch fire wall between.

House Building in the Near East

HOW AMERICANS ARE AIDING ARMENIANS TO BUILD SHELTERS TO PROTECT THEM FROM WINTER'S ONSLAUGHT

By Mary Wilson

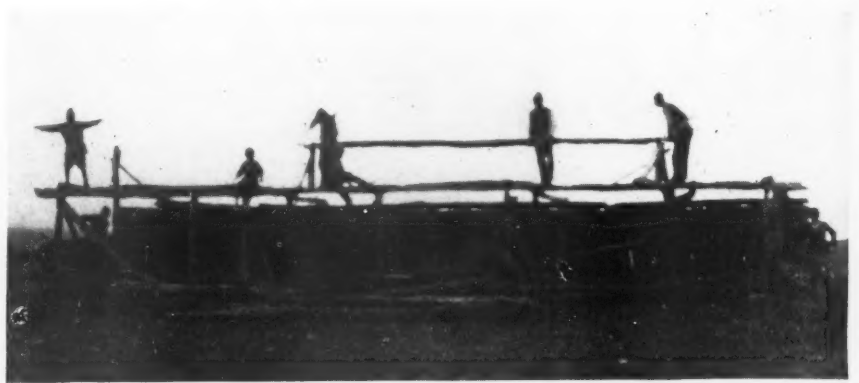
HOUSE burning has been a much more popular pursuit in the Near East during the past few years than house building, but of a sudden things are taking a turn. Houses are going up rapidly. They may not meet all the requirements of househunters of New York or Peoria, but they're houses, and that's something.

The impetus for this house building drive came from America. The Near East Relief, America's official organization for carrying on among the destitute people of Armenia and Asia Minor, decided to rent 6,000 acres of land from the Greek government in Thrace and to install on them 1,000 homeless farmers, who had been driven from their farms by the fighting in Asia Minor and who had been living in rather too close proximity in old fashioned churches, barracks, caves or anything else that they happened to find unoccupied in the crowded environs of Constantinople. They bought farming machinery, draft animals, seed and a few carts and a small supply of lumber and shipped the Armenians off.

The Armenians were willing enough. They had come to the conclusion that nothing could be worse than had been, and they were ready to take a chance. But when they arrived on their new farms and found nothing standing in the way of a house or a barn but a few charred remains of ruined farmsteads, they were a bit daunted. But not for long. They had the land and they had a guarantee of protection against the busy house-burners who are more of a pest in

the Orient than landlords in America, and they were going to have houses.

The small supply of lumber served as a framework, together with what they could salvage from the ruins of the old buildings. Mud and clay and roots and whatever was lying about loose furnished the walls—and red tiles the roofs. Within a few days there was a quadrangle of little clay cottages with neat red roofs. Some of them were very artistic,



Everybody Turns to and Helps Build Homes in the American Colony in Thrace, Greece.

too, the combination of clay and cobblestones used in building the walls giving an effect which the builders had hardly counted upon.

The prize feature of each house is the fireplace. This is far more than decorative. It serves in lieu of the furnace—and at least has the advantage over our steam radiators of not waking the household up in the dead of night with rapid fire announcements that if all goes well there may be heat by morning, and last, but not least, as the kitchen stove. Here what food the people have is cooked.

Carpenters' strikes and bricklayers' walkouts did

not interfere with the erection of the clay city of Thrace. Most of the building was done by the women of the families, while the men planted crops and sent in suggestions. And the women didn't feel abused, either. Only a shortage of materials prevents them from going out and building schools and churches and town halls and shops and any other edifices.

Meanwhile the rest of the many thousand refugees living in damp, rotting buildings, a few square yards to a family, with a blanket at best for a front fence, are eager to build homes of their own. Many



The Head of the House Shows His Spouse How to Go On with the Work and Then She Relieves Him so That He Can Work Elsewhere.

of them—those who have been on the march since the deportations of 1915—haven't known what a real home is in six or seven years. They've lived in the open, in caves, in tents, in abandoned buildings and even in such grand quarters as the ex-Sultan's hunting lodge, at Ismid; but they haven't had a home that wasn't theirs in common with anyone else who might come in and lay claim to a few feet of territory.

This condition prevails thruout the Near East. Orientals have always had a leaning toward stone construction, however, and once they are in a position to build, they will probably use these materials.

While the Near East Relief are doing everything they can in the way of constructive help, teaching the children trades, putting the men and women on farms, the first consideration is feeding and sheltering the thousands—nearly 400,000—homeless refugees during the winter. Tho 60,000 children are already provided for in the orphanages, most of which are



Homes on Armenian Farms May Lack the Finish of Those in the U. S. A., But They Have Enough Individuality to Make It Possible for Their Owners to Distinguish Their Own Front Doors.

old army barracks, and 50,000 more are fed at the soup kitchens, there are a great number still to be looked after. It isn't a house apiece, or a house a family, they're after—but about a square yard per person—\$5 board and room a month. And if the industrious builders of Thrace are a criterion—and the American workers say they are—it's coming to them!

Bakery Branch Shop Designed Like Holland Windmill

By CHARLES ALMA BYERS

ILLUSTRATED here is the unique branch retail store of a large Los Angeles, California, bakery company. The company uses a Dutch windmill as a business trademark and it has designed and built this shop to help emphasize the well-known emblem. The shop was expressly designed and built for a retail

store, and others of similar style are to be established in different parts of the city. The shop is naturally small, containing but a single irregularly shaped sales room equipped with counter and show cases.

The structure was designed by Harry G. Oliver and Ray Smith, of Culver City, California, and is owned by Van de Kamp's Holland Dutch Bakers.



New Hudson River Bridge

(Continued from page 79.)

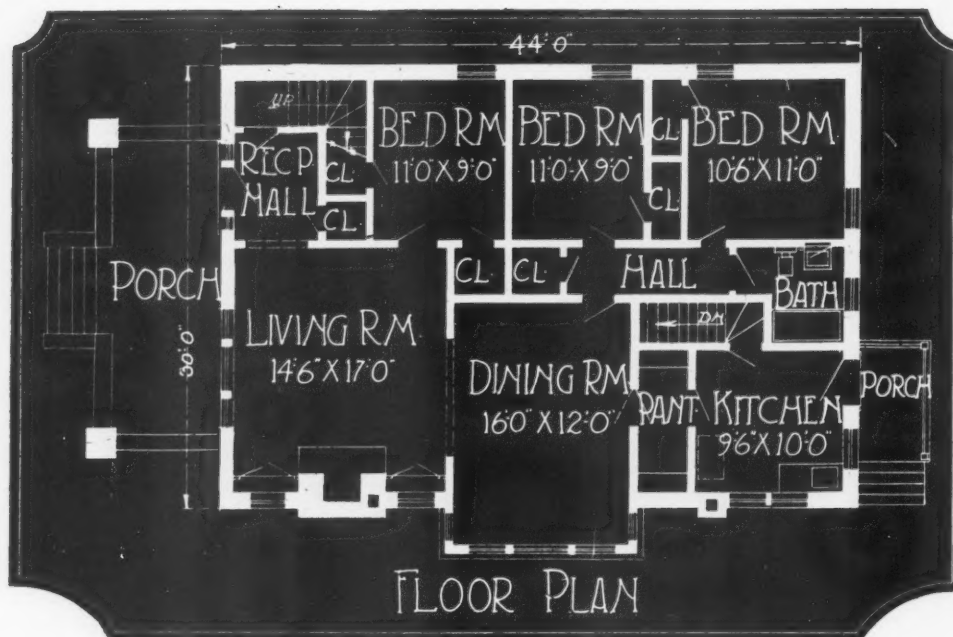
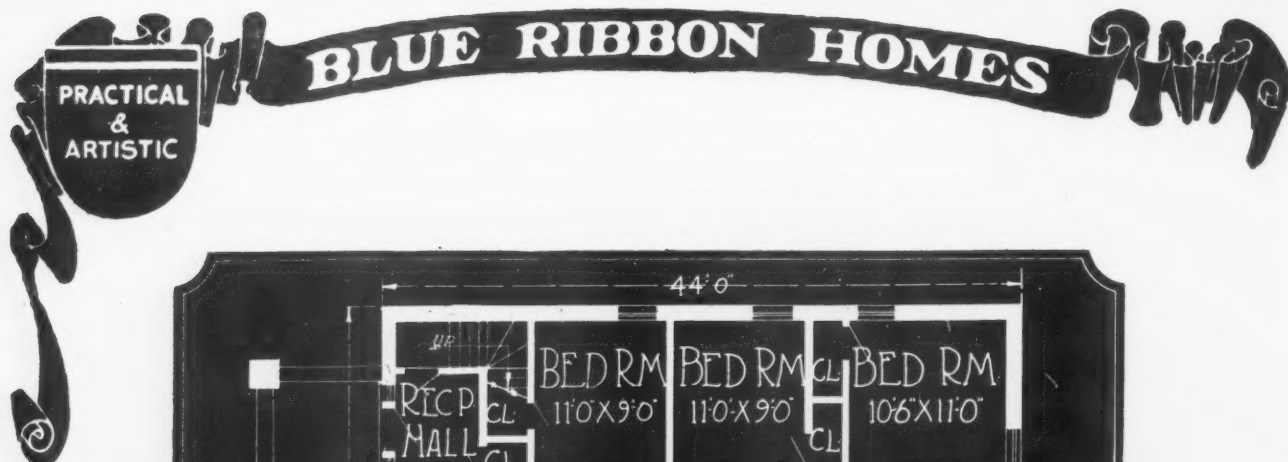
pins of steel pass. Each chain is composed of from 20 to 30 of such eyebars, each from 60 to 70 feet in length and 16 inches wide, arranged side by side and all pin-connected to form a continuous length. Each chord is made up of three chains or banks of eyebars, eighty in all, so that the weight of the suspended floor is carried by twelve chains.

"On the proper strength, functioning, and permanence of the chains depends the integrity of the bridge. Each eybar is separated several inches from the adjacent bar, so that it can be inspected at any and all times. Each cable is enclosed in a covering or gallery of bronze for protection and to permit inspection so that once the eyebars are painted they will be well protected from the elements. The chord thus assembled is 11 feet in thickness as compared with 15 inches for the wire cable of the Brooklyn Bridge and with the covering is 15 feet in diameter."

The new bridge will provide a relief for the traffic congestion between New York and the Jersey coast.



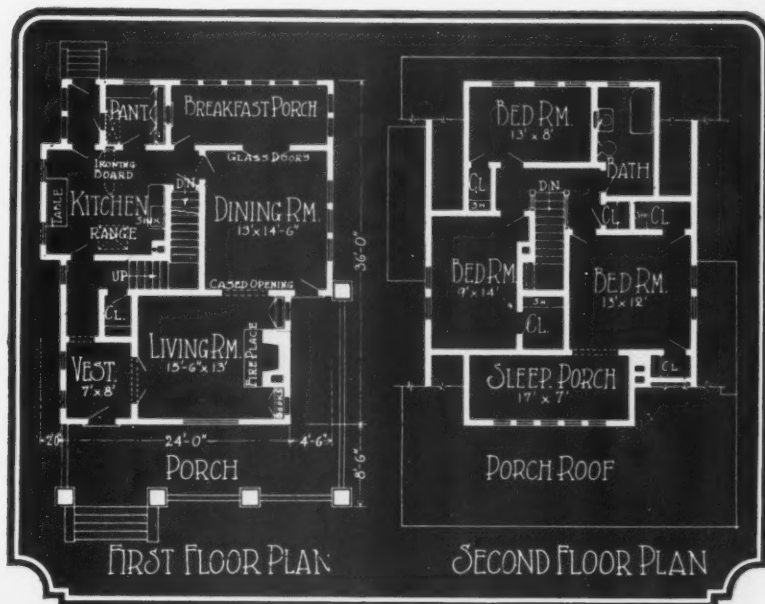
Unique Architectural Design for Branch Bakery in Los Angeles, Cal. It Has All the Features of a Dutch Windmill.



COZY, WELL-ARRANGED BRICK COTTAGE. "Comfy" is the modern word that describes this charming little home most aptly. It is substantially built with solid brick walls, concrete steps and porch and foundation. Under the eaves, half timber stucco effect has been used as supplementary finish. Absence of special design or costly frills makes for economy in construction cost. The broad front porch is particularly frank and inviting. The interior plan calls for six well-proportioned rooms, conveniently grouped in their relation to each other. On one side is the living room, dining room and kitchen in line; and the other, three bedrooms and bath opening into a short hall. A small vestibule prevents an abrupt entrance into the living room from the porch. Size of house, 30 by 44 feet.

BLUE RIBBON HOMES

PRACTICAL
&
ARTISTIC



S MALL SUBSTANTIAL HOME OF PLEASING DESIGN. Here is the type of home that will find ready response in the hearts of the average man and family who want a home that is good looking and sturdy, yet cannot pay too much for it. Builders find this plan quite attractive. It has a broad, open, front porch, a feature that always appeals to families with children. It is frame, set on a solid concrete foundation and has a story and a half, consisting of three rooms on the first floor and three on the second, with an additional sleeping porch on the second floor and a breakfast room-living porch on the lower floor next to the kitchen. In the living room is a good old-fashioned fireplace that "burns," and flanking wall bookcases. The kitchen, dining room and breakfast porch are very closely grouped to avoid unnecessary walking on the part of the housewife. Size, 24 by 36 feet.

Power Equipment Promotes Profits

MACHINERY IS ONE OF THE BIG FACTORS IN MODERN CONSTRUCTION BECAUSE IT SPEEDS UP THE WORK AND CUTS LABOR EXPENSE

ASK the president of a railroad what he is worrying about, he will invariably reply "Overhead." Ask the manufacturer, the contractor and he will reply with much emphasis, "Overhead." To him it is a bugaboo of the nth degree. Let it



Woodworker on the Job. One of the Many Uses of This Labor-Saving Device. Here the Man Is Sawing Lumber for Rough Concrete Forms.

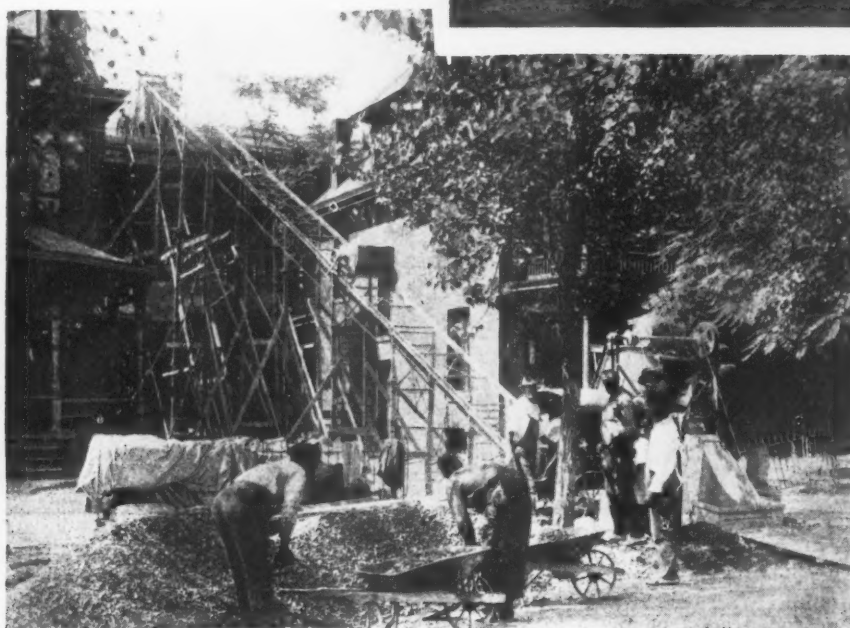
merchant, the grocer and the butcher and their reply will be the same. They charge high prices because their overhead is high. That is at once their defense, their Nemesis, and the cause of their sleepless night. Finally ask the

be said in way of explanation that by overhead is meant labor as well as other expenses of business. To the contractor the labor end is perhaps the most important. How to cut that labor cost?

Machinery! The answer is contained in that one word. Not theory but actual experience has proved this. Thousands of contractors are ready to testify to the truth of this statement—perhaps not by word of



One of the Most Effective Assistants of the Building Supply Dealer and Contractor Is the Motor Truck Equipped with Special Dumping Body.



Placing Plant and Concrete Mixer in Action. The Concrete Is Discharged from the Mixer Into the Cart, Which Is Hauled Up the Incline and Dumped Automatically Into the Forms.

mouth or written statement but by their list of equipment. They have found in the concrete mixer, saw rig, woodworker, gas engine, hoist, concrete elevator, material elevator, air compressor, concrete chute and a hundred and one other pieces of equipment the solution to their problem.

The far-reaching effect of this machinery and equipment is seen from the first step of the new job until the finish. The raw material is loaded on to waiting trucks by automatic means. If it's sand or gravel it comes out of a hopper

which is built so that the truck can drive up to the spout. The door is opened and the truck filled without the lifting of a shovel. At the job the automatic dump body is set into operation and the load dumped without manual labor. Likewise in the lumber yard the truck or trailer is loaded and whisked away at the rate of twenty miles an hour to the waiting workmen. There it is unloaded by another special arrangement on the truck which permits the lumber to slide off the truck into the street.

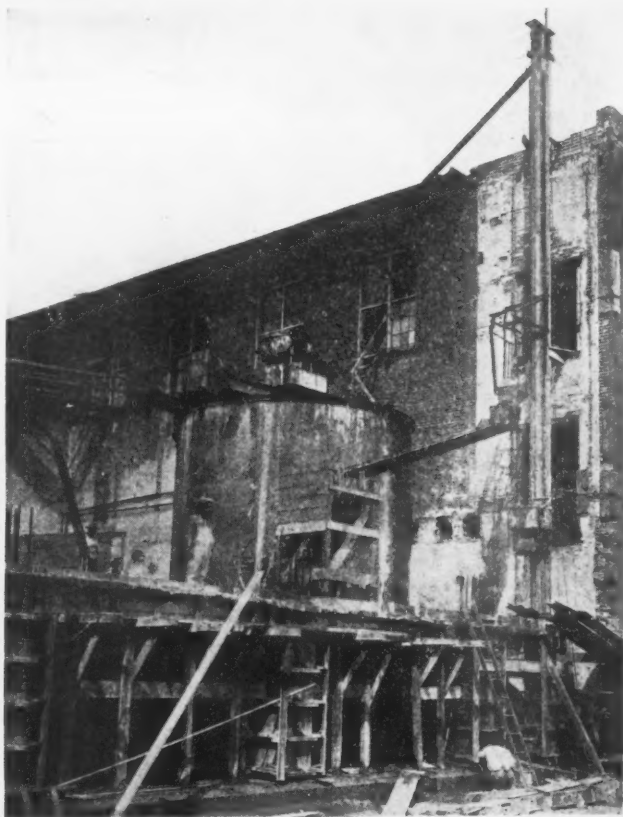
At the job the concrete mixer is in action churning the contents into concrete. As the process is com-



Big Paving Mixer Doing the Work of Many Men in Cold Weather. Mixers Have Become a Necessary Part of Builders' Equipment.

pleted automatic dumping devices pour the contents of the whirling drum into a waiting cart which is either hoisted up a mast or elevator or an inclined track to the concrete chute into which it is dumped and sent on its way to waiting forms, there to harden into the walls that will bear the load of the building for many years to come. It is wonderful, this moving chain of miracle machinery.

From the truck to the street the lumber is then carried to the saw rig, mounted in place and sawed into the required sizes. Hoists carry heavy materials to the various floors and material elevators take care of the brick and lumber. In all of these operations we find men but only one or two who are directing operations or actually running the machinery.



Another Type of Equipment for Hoisting Concrete From the Mixer to the Forms. This Is Particularly Effective on Small Buildings.

That is why large buildings are no longer a matter of years and building work no longer a matter of a few months each year. Machinery and equipment has made possible all year-round construction.



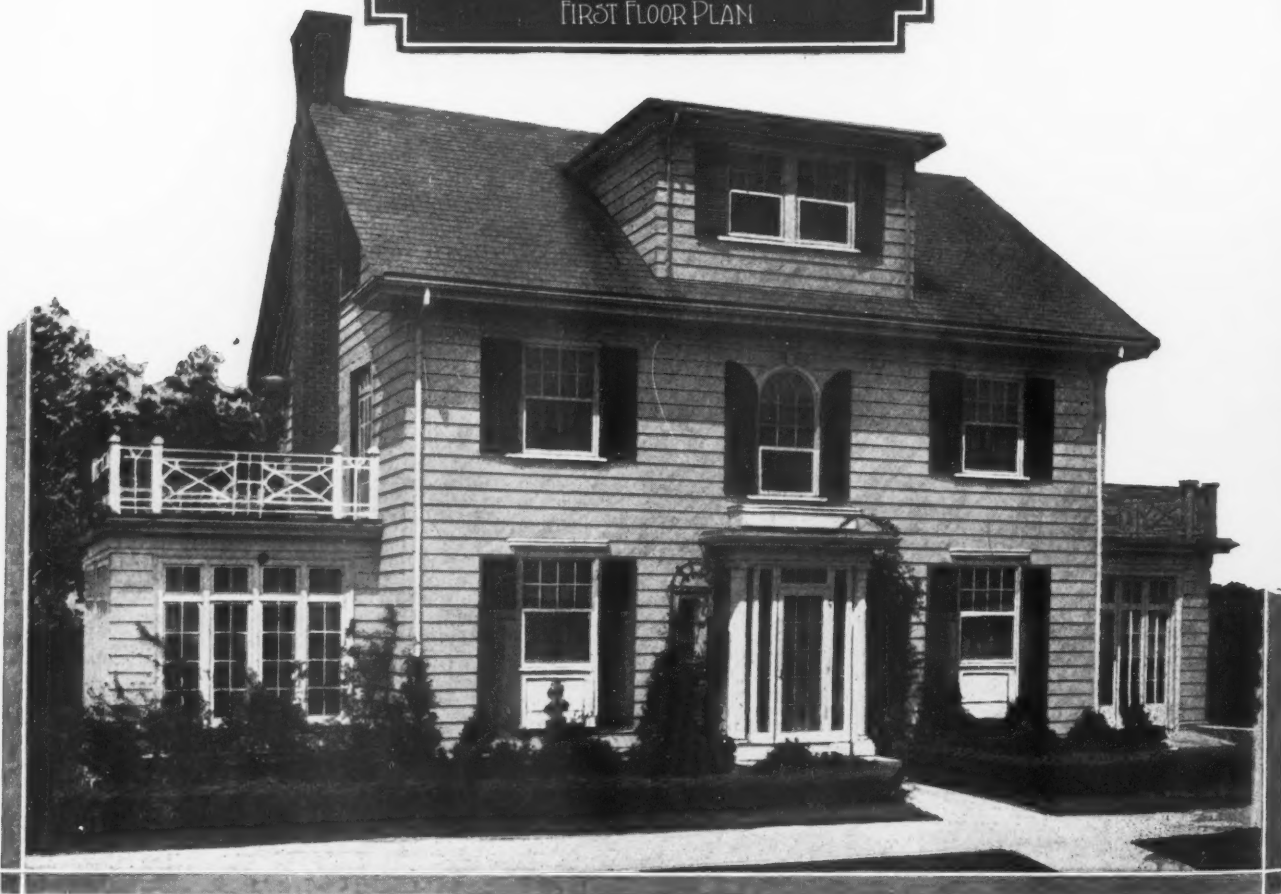
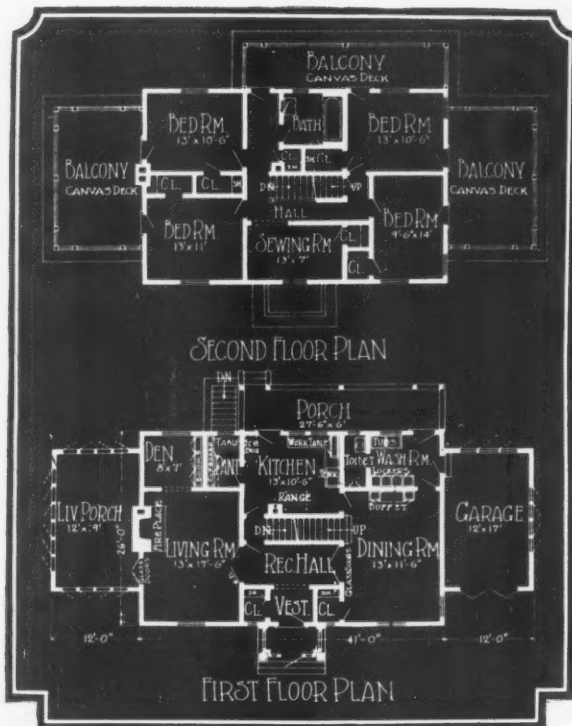
QUESTIONS about building methods always are welcome in the Correspondence Department.



Making Concrete Drain Tile on Power Concrete Products Machinery. This Type of Machinery Has Been Perfected to the Point Where a Plant Can Turn Out Many Thousand Units Per Day.

PRACTICAL
&
ARTISTIC

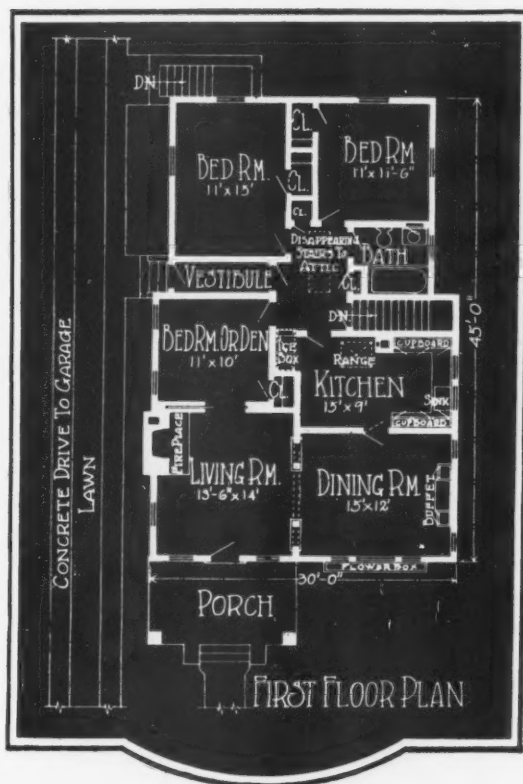
BLUE RIBBON HOMES



CHARMING COLONIAL HOME WITH BUILT-IN GARAGE. The simple, dignified lines of the Colonial design always appeal and this delightful dwelling is no exception to the rule. It has all the quaint, hospitable lines of the century old structure with many of the conveniences of present day building. For instance, it has a garage built-in the house in the form of a wing which appears very much like a sun porch. This room can be entered from the house thru the washroom at the rear. There are seven rooms in the house, not including special rooms like the den on the first floor, and sewing room above. There is also a large, bright living porch off the large living room. Balconies above the porch and garage form an attractive addition to the second floor arrangement. These balconies are covered with special canvas flooring. The house is 41 by 26 feet.

BLUE RIBBON HOMES

PRACTICAL
&
ARTISTIC



PRETTY WESTERN BUNGALOW OF SIMPLE BUT PLEASING LINES. The obvious simplicity of this charming little home gives it a quiet dignity that is very appealing. Moreover it makes for economy in construction costs. There will be a demand for many homes of this type during the next year by homeseekers of moderate means. It is sturdy, frame on brick foundation, and almost Colonial in many of its details. There are six cozy rooms in this dwelling, of which three are bedrooms very conveniently grouped together in the rear of the house away from the living room. One of the bedrooms can be used as a den. The other rooms are not very large, but comfortable and close together, so that the housewife will find her work considerably lightened thru the saving of many steps. A double concrete trackway leads to the rear garage. Size of house 30 by 45 feet.

Make The Home Beautiful

FURNITURE IS IMPORTANT FACTOR IN MAKING THE FARM HOME A REAL PLACE TO LIVE IN.

By Ethel Parke Jones

TO make the small home, and especially the farm home, a thing of beauty with the least possible expenditure—*there*, is an art worth everything to all of us. When I say everything, I mean—everything worth while, including the happiness of the entire family. As a matter of fact money is *not* the great factor in the making of a beautiful interior.

These are the days when many of us are finding it possible to send out sons and daughters to good schools and colleges. So far, so good; but we cannot stop there. Even tho the only desire of the farm parents may be to provide the best education for these young people, and that best *seems* to call for sacrifice in the home, let not the parents think to sacrifice the beauty and comfort of good furnishings to this end! If they do, they are overlooking an essential part of the very thing they are striving to attain. Let not John or Mary return at the end of his or her book education to a home full of conglomerate furnishings that have no relation to each other nor to the occupants of the home. These young people cannot have failed to learn

what's what and it may be fatal.

There is no reason why beauty of line and color is not available to such a home. Yes, and not only to this home but to those from which sons and daughters may never go away to school. This is one source of education that gives a culture not found in text-books. A native culture—the refinement of living with beautiful things.

Again I say, money is not the great factor in the making of a beautiful interior. Who has not seen the spectacle of a man newly rich (sometimes a farmer, but more often not), buying promiscuously and without consideration highly ornamented and costly stuff that is copied from the palaces of Europe, but which placed in his home of good American simplicity becomes only a screaming disclosure of his ignorance.

Consider the simplicity of our forefathers in the Colonies. Some of the types of furniture produced or adopted by them were peculiarly fitting to simply constructed homes. These types are for the most part still good. They have the elements of beauty and service which last. Of these I want to tell you, as well as of some types used in cottages and chalets in Europe which are quite applicable to our general styles of farm homes.

Granting there is always one room wherein the family may gather socially and wherein visitors are always welcomed, let us begin with this room. This is the room which is going to mean the most to your young people. It is going to be the most important factor in their decision about remaining on the farm or rushing off to the cities when they grow up. And this applies just as much to those who have not been away to school as to those who have.

Most farm houses are low-ceilinged. We need not go into detail on this; there are doubtless very good reasons for this being the case. Now—this low room means that the furniture must not be massive or clumsy, else some delightful possibilities will be lost. For this best room then—call it living room, parlor or whatever you wish—we want chairs that shall be comfortably shaped and large enough but graceful. For an upholstered chair the Wind-



Corner of Living Room in Farm Home. The Furniture Should Not Be Massive or Clumsy. Chairs, Comfortably Shaped, but Graceful, Are Good. This Room Is Very Often the Important Factor in Keeping the Children on the Farm.

sort type in all its varieties is good. Sometimes the seats are just the wood shaped for comfort, sometimes of rush, making them slightly easier. In upholstered chairs and couches there should be nothing heavy. There has been a wave of such things in huge elephantine lines suitable only for mammoth hotel lobbies or clubs and of questionable beauty even in that capacity. They are not for the small home. They ruin it at the start. Neither is the type called "Mission" suited to this house. Mission has the merit of being all American and was a sincere attempt to create something independently of the Old World. In that it has succeeded, but not as beautifully as we could wish. Too heavy and square in line, too monotonously brown in color, we must forego this type if we would have our room beautiful. There are simple line sofas, not too large; gate-leg tables with great merit for just this kind of room; drop-leaf tables and small stands to use beside the sofa and on which a lamp can be placed to advantage; there are stools made to the height of a chair seat which, when used with a small comfortable chair, give the tired member of the family a chance to recline. And this small comfortable chair can be well-upholstered and still have shapely delicate lines. There are tip-top tables, or if you prefer "pie-crust," which are large enough to hold a few books and a lamp, but not too large for a small room. There are simple table desks and spinet desks all of which lend an air of permanent beauty to the low-ceiled American farm living room.

But furniture is only one important factor in the making of this delightful room. The wall color, floor coverings and window drapes as well as the placing of pictures will have much to do with making or marring this room as a thing of beauty, but these must come in another issue.



New Ohio Stadium Under Way

THIS is how the Ohio Stadium now under construction on the campus of Ohio State University at Columbus, O., looks today. The contractors are pouring concrete into forms for the first nine rows of seats. The lower deck alone, embracing 54 rows of seats, will extend back 148 feet or four times the depth of the seats shown in the picture. The lower deck will seat 42,000 people, the upper deck 21,000.

Architecturally, the distinctive feature of the Ohio Plan of Stadium is the double deck. The advantages of the upper deck are to bring top seats closer to the playing field and to afford shelter for the seats in the lower deck. The "U"-shape of the structure, leaving one end open, has the advantage of facilitating ven-

tilation and permitting "straight-aways" for the track men.

The E. H. Latham Co., of Columbus, are the contractors.

Excavation for foundations began in August. By September more than a mile of standard gauge and another mile of narrow gauge track had been laid, a yard mixer installed and two locomotive cranes brought onto the scene. With a dozen yard buckets moving practically continuously, nearly 6,000 cubic yards of concrete had been poured into foundations, boxes and the first rows of seats up to November 15.

Stadium construction will eventually consume 75,000 barrels of cement, 22,000 tons of sand and 45,000 tons of gravel. Material is being furnished by the Consumers Supply Co., of Columbus.

Completion of the Ohio Stadium, with its two decks of 64,000 seats, is scheduled for October, 1922.



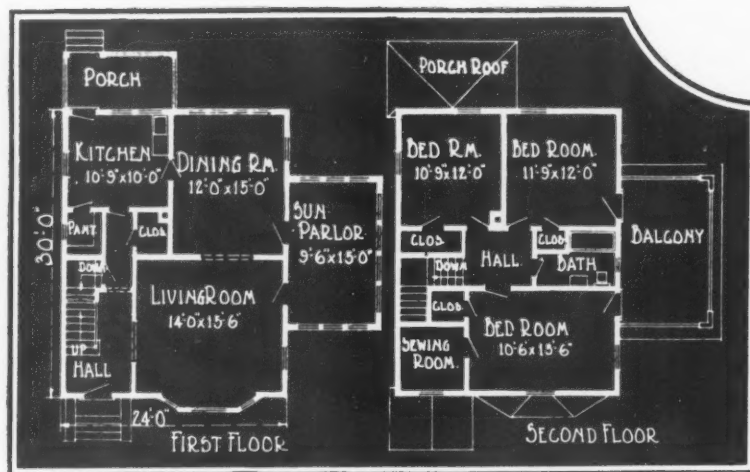
View of Ohio University Stadium as It Appears Today. This Stand Will Hold 63,000 People When Completed Next Fall.

Lead Too Pure for Cathedral Roofing

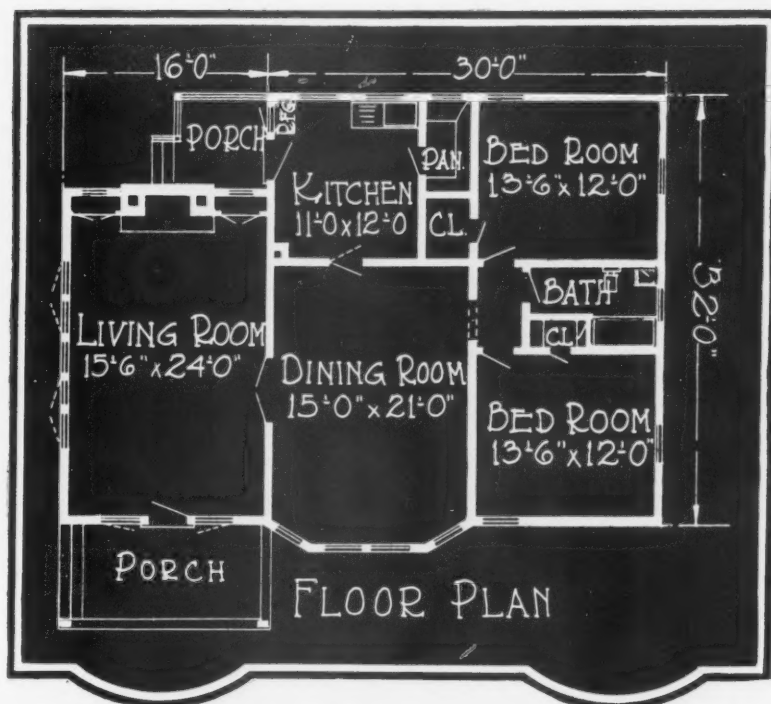
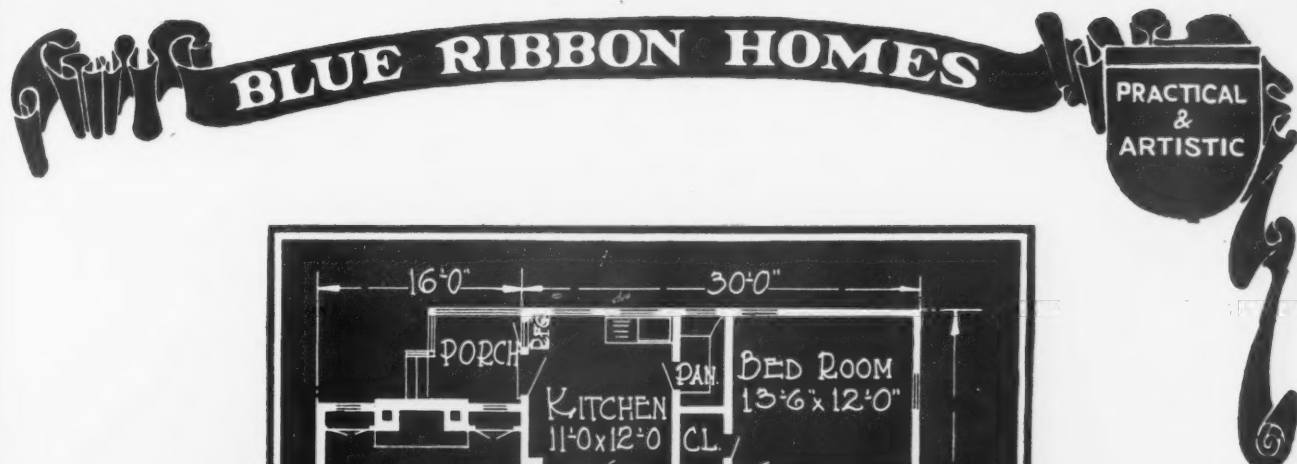
THERE is such a thing as too pure lead for roofing purposes. The ancient Gothic cathedrals of Europe were topped with this gray metal that blended well with the stone work and the style of architecture.

Lead was the metal that was specified for the roof of the Episcopal Cathedral of Washington which is now being built, but after it had been applied for some time it was found that sheet lead on the steep roof slopes had a tendency to flow downward under its own weight and the heat of the sun. The nail holes enlarged and allowed the metal to slip partially off.

Metallurgists of the Bureau of Standards of the Department of Commerce were called upon and they found that the grade of commercial lead used was 99.9 per cent pure, far too pure for satisfactory roofing. They recommended the use of what is technically called "hard lead" which contains 6% antimony.



DISTINCTIVE, ECONOMICAL HOUSE DESIGN. Here is shown the familiar square-shaped house with slight variations in roof and entrance that give a little individuality that is helpful. There is also a side sun parlor which adds much to the convenience and comfort of the house. The front entrance, of simple yet dignified and inviting bearing, is set to one side to make way for a bay window in the large living room. The steps are brick, as is the foundation, while the main part of the house is stucco with just a touch of shingles under the eaves. Six large, comfortable rooms, sun parlor, 9 feet 6 inches by 15 feet, and sewing room upstairs are provided for in the floor plans. Living room, dining room, and kitchen are on the first floor, while the bedrooms are upstairs. The house is 24 feet wide and 30 feet long.



"GOOD THINGS COME IN SMALL PACKAGES." The old saying has a definite and practical application in this house. It is small but admirably suited for the needs of many families who will be building a home of their own this spring. Coziness is the keynote of the whole design while simplicity insures economy in cost. It has a pleasing white stucco exterior, low roof with projecting rafters, and a very light but attractive cover over the front entrance. The size of the house, 30 by 32 feet, means there can be little waste space. For that reason the front door opens directly into the living room, which is a very large room for a house of this size. It has a fireplace with wall bookcases on each side and is 15 feet 6 inches by 24 feet. Dining room, kitchen and two bedrooms complete the floor plan arrangement.

Electrical Suggestions for the Building Contractor

AMPLE PROVISION FOR EFFECTIVE USE OF ELECTRICITY IN HOME IS ONE OF BUILDER'S RESPONSIBILITIES

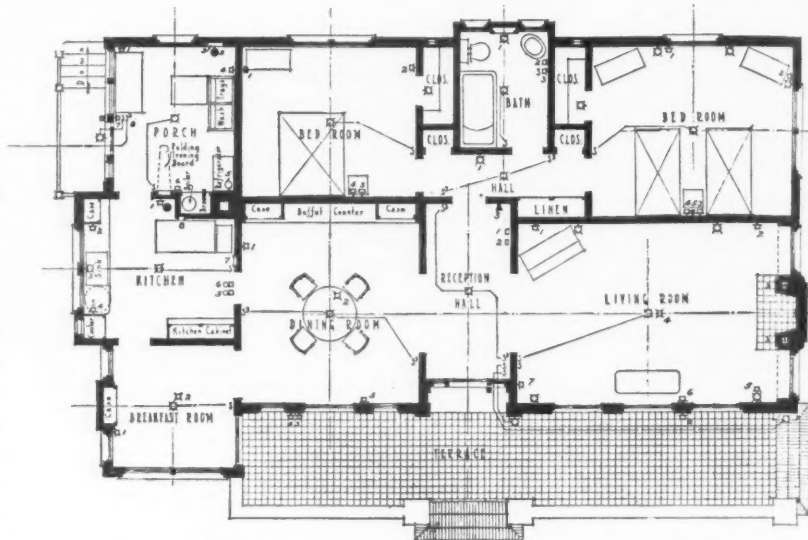
By Reginald Trautschold, M. E.,

The Society for Electrical Development, Inc.

WITH something like thirteen of the twenty-one million homes in the United States situated where electric service can be secured, altho as yet only a little over a third of these homes have been wired for electrical comforts, and further with electric service procurable in three and a half times as many communities as is gas service—either artificial or natural—it would appear almost unnecessary to state that provisions for the effective and economical use of electricity in the home constitutes one of the chief responsibilities of the building contractor today. This should be quite obvious, but it is nevertheless a very regrettable fact that the average building contractor does not appear today to appreciate either his responsibility in the matter or his opportunity. In fact, it is probably true that the great majority of even houses of recent construction are quite inadequately and generally inconveniently wired.

There is naturally a logical explanation of this situation. There is scarcely a well established building contractor who did not lay the foundation of his business before the days of the electrical home. Even twenty or twenty-five years ago wiring a house for electricity was more or less an innovation—an extra which was something of a luxurious nature to be cov-

ered by a small percentage allowance on the cost of building construction. In those days it probably deserved or warranted no more consideration, for then



Representative Floor Plan Showing Ideal Arrangement of Electric Fixtures and Outlets.

wiring a house for electricity consisted in either substitution for or supplementing a few lights in a system of gas lighting which of necessity was quite limited in extent and inflexible. Today a house is, or should be, wired for comfort and it is necessary to plan the wiring, not only for an extremely flexible system of illumination, but so as to provide facilities for the use of the many electrical appliances which distinguish the modern home. Wire for comfort should be the underlying motive in electrical work, but this entails greater familiarity with the progress made in electrical development for the home than can possibly be provided by a more or less arbitrary allowance of 1, 2 or 3 per cent of the building cost to cover the electrical work.

Convenience Outlets

In the first place the customary lighting circuits—now familiar by reason of the standardization brought about by the National Electric Code, which is incorporated in virtually all building ordinances—will not suffice for all household requirements, even should they be installed in greater number than heretofore deemed necessary. These circuits, which



Electrical Convenience in the Laundry Has Greatly Reduced Onerous Work of Housewife. The Contractor Must Provide for This Comfort.

should be of No. 14 B. & S. wire, or heavier, are intended for lighting purposes primarily and should never be called upon to accommodate any but low wattage appliances. Even these latter can be much more effectively and conveniently accommodated on supplementing circuits thru so-called convenience outlets.

These convenience outlets are intended primarily for the accommodation of appliances and of the portable lamps which prove such desirable adjuncts in securing flexible, attractive and convenient lighting systems.

Their importance upon special or even on lighting circuits cannot be overemphasized. Even the speculative builder admits that they add to the desirability of a house and he is gradually looking upon them as desirable "extras." First one convenience outlet was provided per room, then two and now sometimes three or more. Unfortunately, the number of outlets provided has frequently been arrived at without much thought—an arbitrary number simply decided upon. Because it proved beneficial to install one, two were provided—if two proved desirable, three were furnished. Obviously, such arbitrary additions are not conducive to the best development of the electrical home, can hardly appeal to the judgment of the experienced building contractor and will scarcely tend to remove the electrical work from that class of "extras" which are subordinated to general construction work. There is a very good reason why the convenience outlets in a house should be adequate in number, but the way to ascertain the appropriate number is by logical rather than arbitrary anticipation of requirements.

For example, at least three convenience outlets should be provided in the kitchen—one for a washer, another for an iron and a third for a cleaner—while in the dining room separate outlets should be provided for percolator and toaster, as well as one for the always necessary vacuum cleaner. A similar minimum number of convenience outlets for each room of the house is indicated by a little thought, if the wiring is planned for real comfort and convenience. It is not the intention of the present article to specify the number of outlets for the various rooms, however, for this is a responsibility which should be shared by the architect and building contractor, but rather to make a few practical suggestions concerning electrical provisions with which every building contractor should be quite familiar.

The National Electric Code wisely stipulates that no individual lighting circuit should carry more than



Receptacles for Fans Are Important. In the Hot Days It Is Very Convenient to Attach the Fan to a Wall Receptacle in the Dining Room, Sun Porch or Other Parts of the House.

sixteen lamps or a connected load exceeding 660 watts. In special cases under certain conditions, permission may be secured for a connected load of 1,320 watts on one circuit, but in every case protection by some specific size of fuse is also specified—at present, a 10-ampere fuse. Applying these regulations to the wiring circuits for appliance use as well as for lighting—is, furthermore, essentially a responsibility of the building contractor as long as he assumes responsibility for the completed building.

Unfortunately, the various rules as drawn up at present, when applied to the use of electric appliances, introduce conflicts which, were the code strictly enforced, would prohibit the installation of many of the most desirable electric appliances on the market. The result is that wiring for comfort is apt to suffer and the code to fall into disrepute with the public and with the building contractor—at the expense of the contractor and of the public as well.

The base of the trouble—the difficulty to reconcile to wiring for comfort—is due largely to a complexity of requirements and to the emphasis placed in the underwriter rules on wattage limitations which mean little to the uninitiated, for the simple reason that electric energy as supplied to the household is so safe that the regulations can be disregarded to some extent with impunity. The blame for this condition is traceable to popular ignorance of the laws governing electricity, particularly in respect to current voltage, wattage and ampereage. These three characteristics, or rather their respective units of measure—volt, watt and ampere—have never been properly explained to the public or to the building contractor.

EDITOR'S NOTE: The second and final installment of this article will appear in an early issue. Watch for it!

DESIGN of SAFE CONSTRUCTION

By Charles W Leigh

Associate Professor of Mechanics, Armour Institute of Technology

Analysis of a Barn Truss

ARTICLE 25 OF AN EXTENSIVE SERIES ON STRENGTH OF MATERIALS

MR. F. C. LEWIS of West Lafayette, Ind., a reader of the *AMERICAN BUILDER*, sent three types of barn roof trusses to the editor, and suggested that many readers would be interested in an analysis of such trusses. I shall endeavor in this and following articles to attempt such an analysis.

Fig. 1 is a view of the interior of the barn showing the trusses. The rafters are spaced 2 feet from center to center, and I assume that the trusses are 12 feet apart. In this article I shall assume a load of 60 pounds per square foot of roof surface to care for the wind, snow, and dead loads. Whether this is too great or not will make no particular difference here, as the method of treatment is the thing with which we are concerned. Should any builder wish

to make other assumptions as to vertical loads, he may do so and follow the method just as will be done here.

On the 60° slope there will be a load of $12 \times 16 \times 60 = 11,500$ pounds, or 5,750 at each end of the span. On the 12-foot slope there will be $12 \times 12 \times 60 = 8,640$ pounds or 4,320 on each end joint; $5,750 + 4,320 = 10,070$, or 11,000 pounds for convenience, on the next joint and $4,320 \times 2 = 8,640$ on the top joint.

Now any attempt at an analysis of the truss because of its construction leads to indeterminate forms. That is, there are more unknowns than we are able to find, when methods of ordinary roof trusses are tried. Some assumption must then be made. Because of the collar beam at C the top is probably rigid enough to assume that there is no moment at C. In

the same way the floor girder holds the ends A and B secure so that we may also assume no moments at these points. The truss may then be treated as a three-hinged arch. In such a structure the reactions at A and B are not inclined. The first step in the problem is to find these reactions.

Fig. 2 shows the truss with its loads. Now the truss is in equilibrium under the loads and the vertical components of the reactions at A, B and C. We will first find these vertical components. In Fig. 2 the load diagram E, F, G, H, I, J is drawn to scale 5,000 pounds = $\frac{1}{4}$ inch. The point O is chosen as a pole and joined to E—J, of the force diagram.

The vertical reaction at A and the load of 5,750 are in the same straight line. The point Y is taken in a convenient position and a line drawn from Y on reaction A parallel to OE to meet 5,750. But since the two are in the same straight line no line is really drawn. From Y draw a line parallel to OF to meet fg, the 10,000-pound load at I. From I draw

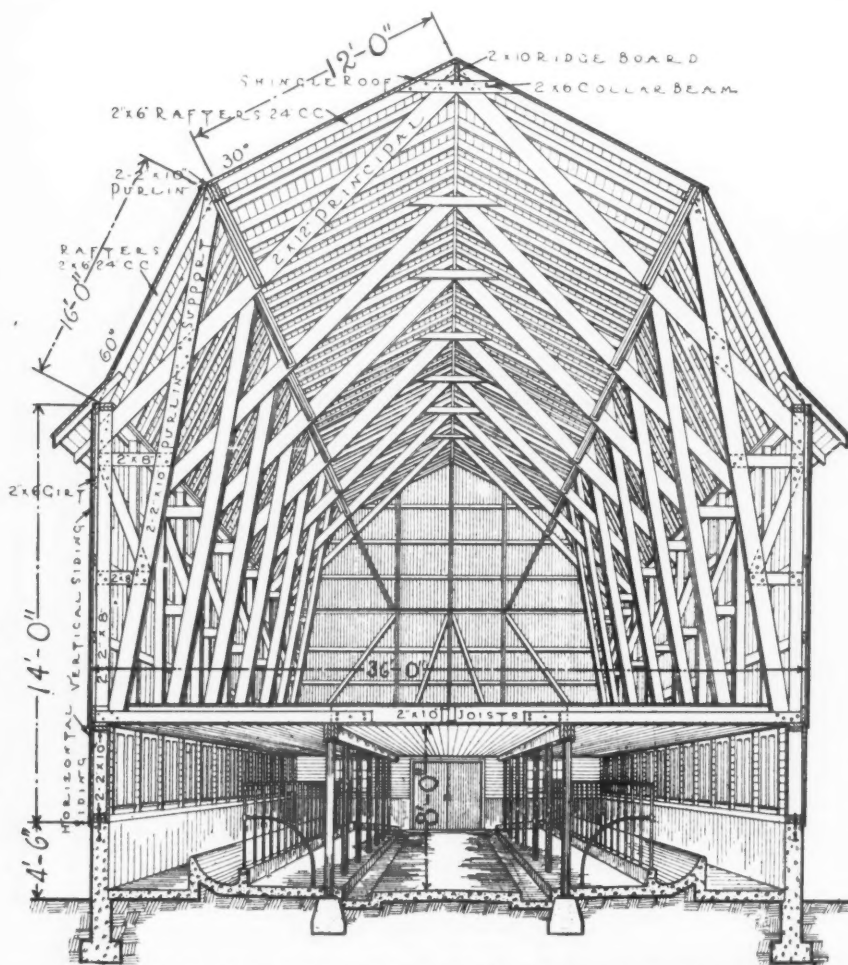


Fig. 1. Cross Section of Barn Showing Trusses in Position.

a line parallel to O G to meet f g at 2. From 2 draw a parallel to O H to meet h i at 3, and from 3 a parallel to meet i j at 4.

Now draw Y2 and 2-4. We then have the completed funicular polygons for each half of the arch. From O draw a line parallel to Y2, to meet E j at M. Also a parallel to 2-4 to meet E J at N. Then N M is the vertical reaction at C. Also J N is the vertical reaction B, and M E is the vertical reaction at A.

Because of the symmetry of the truss and the load each half of the truss will take half of the vertical reaction at C. Then find the middle of N M and call it P. N P represented by R_{e-r} is the reaction at C on the right half and P M or R_{e-l} is the vertical reaction on the left half.

In order to find the full reactions at A we will consider first that caused by the resultant load at C alone. Since there is no moment at C, the moment of the reaction at A about C must be zero. But this can only be true when the moment arm is zero. That is the direction of the reaction from A to C. If then from M we draw a line parallel to A C to meet a horizontal from P to meet at K, we have K M or R_1 , as the reaction at A due to the load at C. Then the full reaction at A will be that due to the loads, or M E and that due to C or K M. If then we draw K E we have the reaction R_1 at A in magnitude and direction. Similarly J K is the reaction at B. Now whether the assumption made at the outset is actually realized is of course problematical but it at least would undoubtedly be on the side of safety, making the reactions and stresses as least as large, if not larger, than actually exists.

The next step is to find the stresses in the members. We will begin at A. Starting from K, we go from K to E, then from E draw a line parallel to e l to meet a line drawn thru K parallel to e k. This determines point L. We now take the second joint on the side wall formed by members l e, e s, and s l. Draw L E, then E S parallel to e s to meet a parallel to s l. But this shows S and L coincide, and there is no stress in s l due to the dead loads directly. Next, take the joint l, s, t, k. Since there is no stress in l s, there can be none in s t. Therefore, L, S and T coincide. Stress l k = stress t k. The next joint is t, u, k. Since k t and u k are in the same straight line, the stress in t u must be zero, as it cannot have a component perpendicular to t k. That is point U coincides with L, T and S and stress k t = stress u k.

Now consider points e, f, v, u, t, s. Start at U, T, S and go to E. Then to F. From F draw a line parallel to f v, to meet a line thru U parallel to u v. This locates V. Next consider point u, v, w, k. Go from K to U; U to V. From V draw a line parallel to v w, to meet a line thru K parallel to k w. This locates point W.

The last joint is f, g, x, w, v, f. From V go to F, then F to G. From G draw a line parallel to g x to meet a line thru W, parallel to w x. But W and X

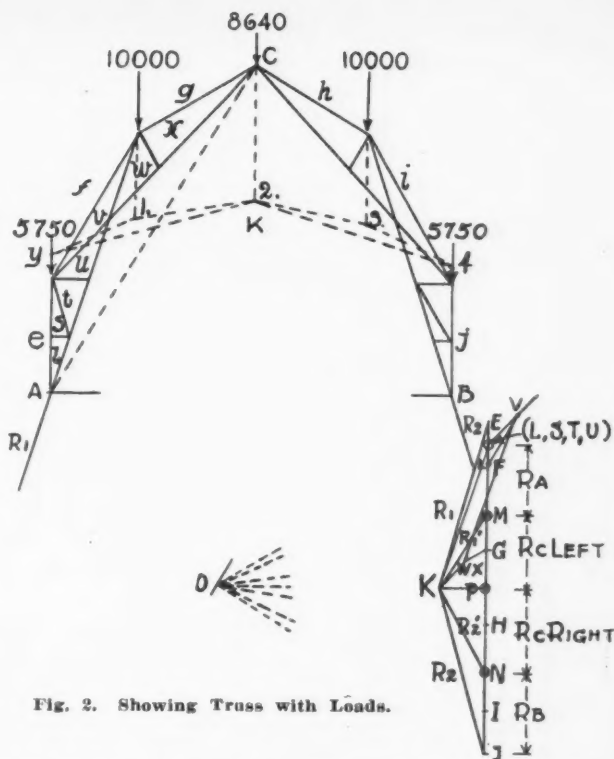


Fig. 2. Showing Truss with Loads.

coincide, since a glance at point W x k shows the stress in w x to be zero. The magnitude and character of the stresses may now be determined.

It must not be understood that in the actual truss there is no stress in es, st, tu and wx. A wind load would cause stresses in some of these. In the next article I shall attempt an analysis of the truss when acted upon by wind load.

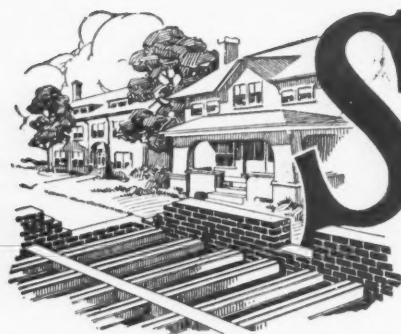
Then again the two long inside members of the truss really act as columns, and one function of these cross members is to prevent buckling. That phase of the subject will not be considered at this time.

The stress lines may now be measured and stresses calculated to the scale 5,000 pounds equals $\frac{1}{4}$ inch. The reader may then see from the dimensions of members shown in Fig. 1 if they are strong enough.



LIME, either lump or hydrate, has many uses around the house other than in mortar, plaster, stucco, or concrete. It has been used as a deodorant and disinfectant for centuries. There are references in the Bible wherein lime and whitewash are specified for purifying the home after plague. Many ancient writers recommended that quicklime be spread over areas which had a tendency to become foul.

Frequently cellars are damp and musty, especially during the winter when it is too cold to open windows and doors for proper ventilation. The musty odor and dampness may be overcome by placing about a peck of quicklime in a metal box in the cellar and a few lumps in out-of-the-way places. The lime will absorb the moisture from the atmosphere and thus prevent the formation of mold and its consequent bad odor.



STEEL LUMBER Construction

Uses of Steel Lumber in Different Construction

APPLICATION OF MATERIAL TO SCHOOL HOUSES, GARAGES, SMALL STORES AND APARTMENT BUILDINGS

By Gilbert Canterbury

Editor's Note—This is the thirteenth article of a series on the use of steel lumber in modern construction. Readers are invited to ask questions pertaining to this subject. Answers to all inquiries of general interest will appear each month in this department. Write in your problems now.

MOST contractors thruout the country who have been bidding on public school jobs during the last year have had occasion to investigate designs specifying steel lumber. This material has become exceedingly popular for fire proof floors and roofs in this type of building. At the end of 1921 in Ohio alone a total of 93 public schools have been constructed with steel joist fire proof floors and roof and some other 225 public schools have been erected with this material in other states.

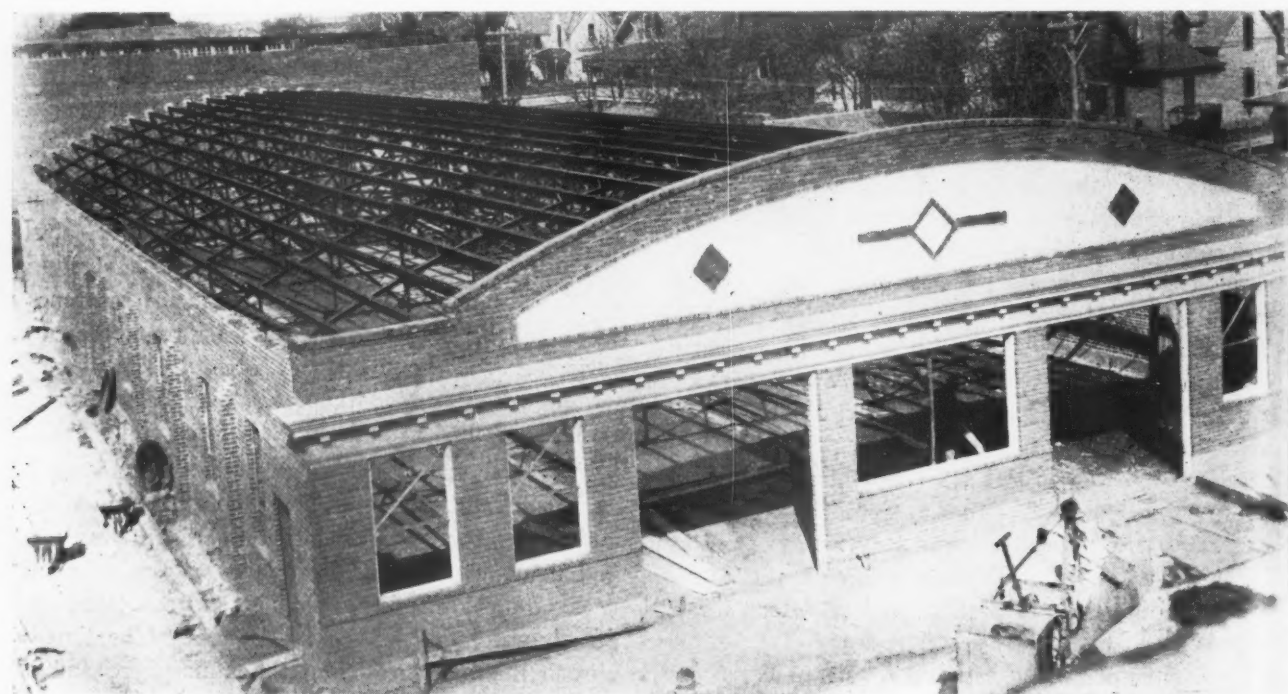
In an accompanying picture a view of the Franklin School at Fort Wayne, Ind., is shown. This school was designed by Griffith & Goodrich, Fort Wayne architects. The picture shows the light steel joists supported on structural steel I-beams and workmen engaged in placing the metal lath, which will act as centering and reinforcement for a 2-inch concrete slab.

Garage Curve Roof

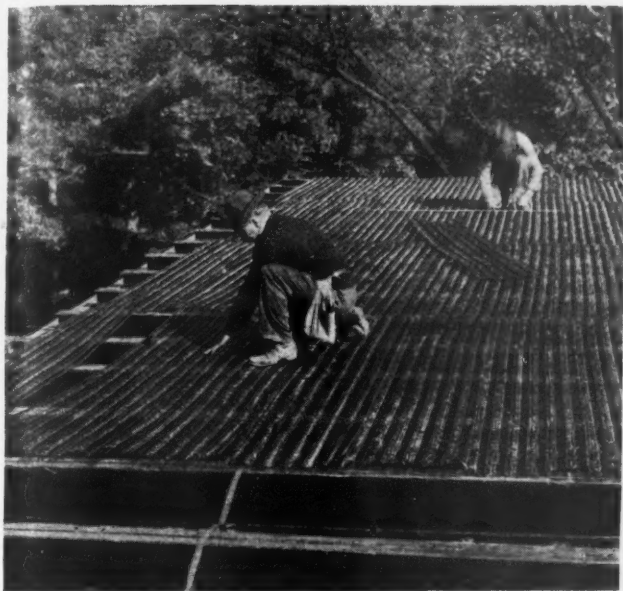
In the accompanying picture of a fire proof garage at Blackwell, Okla., a splendid view is shown of steel lumber joists in the construction of a curve roof. Structural steel trusses span from wall to wall thus leaving the main floor of the garage unincumbered with columns. Steel lumber joists run lengthwise with the building across the tops of the trusses. The joists were cut of a length to span two truss bays. Metal lath was attached to the tops of the joists and a 2-inch concrete slab spread over the lath. Basement was built under a portion of this garage and in those portions steel lumber joists supported the floor.

Small Store Buildings

Steel lumber is also coming to mean the solution for many contractors of the problem of building fire-proofness into small store buildings. Nearly all buildings of this type are erected with masonry walls and thru the use of steel joists it is a simple matter to fireproof floors and roof by spanning steel joists from wall to wall, attaching metal lath and covering the lath



Curve Roof Garage Showing Steel Joists Supported on Steel Trusses. This Is One of the Small Type Buildings in Which Steel Lumber Is Being Used Very Widely.

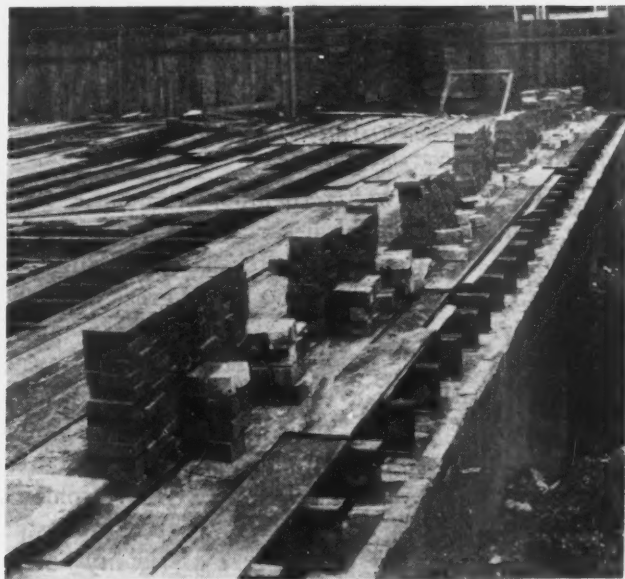


Placing Metal Lath Over Steel Joists in Ohio Store Building.

with a thin concrete slab. First floor joists in buildings of this character are usually left open in the basement. Metal lath is attached to the bottoms of the second floor joists to serve as a base for ceiling plaster. The result is to eliminate all combustible structural material. If this is followed up by installing metal sashes and cement or composition finish floors the result is a thoroly fireproof building erected at less cost than any other type of fireproof construction. The accompanying pictures show a two-story store building erected in Ohio suitable for stores on the first floor and offices or apartments on the second floor. One picture shows metal lath being attached to the second floor joists. In estimating the cost of structures of this kind it is well to remember that no forms of any kind are required for the concrete floor or roof slabs. The concrete is mixed to a consistency comparable to that which is used in sidewalk construction and is spaded on to the metal lath and troweled out to a thickness of about two inches. Where wood floor surface is desired 2 x 2 wood strips are nailed lengthwise with the joists across the top of the lath and the concrete fill placed between these strips. The wood surface is, of course, then nailed to these nailing strips.

Fire Safe First Floors

In the construction of multiple family dwellings it is eminently desirable to have at least the first floor built safe. The majority of fire hazards of this type of structure are located in the basement and a high measure of fire safety is obtained for the entire building if steel joists are spanned across the basement walls and covered with metal lath and a 2-inch concrete



Firesafe First Floors for Apartment House Built with Steel Joists.

slab. Wood floor surface is usually required for this type of building and for this purpose 2 x 2 nailing strips should be nailed along the tops of the joists. One of the accompanying pictures shows first floor construction of a small apartment house. The light steel joists are spaced nineteen inches on centers and in the picture it will be noted that each joist has bearing of about four inches on the brick wall. This manner of treatment provides a high measure of fire safety at a minimum of expense and the construction is handled with the ease and speed of wood joist floor construction.



AS many saws are broken in winter, owing to the great risk in sawing frozen timber, the greatest care should be taken to prevent any undue strain. Keep the points out full, square and sharp, or the saw will dodge out of the cut, particularly in slabbing, as the corners on the log side do the most cutting and soon get dull in sawing knotty frozen timber. Use no more set than is absolutely necessary.



Franklin School, Ft. Wayne, Ind., Showing Steel Joist Construction.

House Construction Details in Concrete

II—SOME SUGGESTIONS FOR APPLYING STUCCO SURFACING ON CONCRETE BLOCK

By A. J. Curtis

EDITOR'S NOTE—This is the second article of a series on "House Construction Details in Concrete." The first article appeared in the November issue.

STUCCO has won recognition as a neat, water-tight and economical surface for residences and other small and moderately sized buildings, and the recent artistic finishes have added greatly to stucco popularity.

Most of the difficulty with cracking, so prevalent during the earlier years of stucco application, has been overcome, even where applied to wood frame. Metal lath or metal mesh is generally considered a better base than wood, but even the former may move somewhat with its backing. So the masonry base for stucco claims the advantage of a degree of rigidity not possessed by other backings. The perfect masonry base must have sufficient mechanical bond and uniform absorption (suction) of the proper amount thruout the surface and it must produce a stuccoing surface which is as nearly as possible a flat, true plane. Concrete

2. Don't use dirty sand or sand that is not properly graded. Not more than 5 per cent should pass a 100-mesh screen.

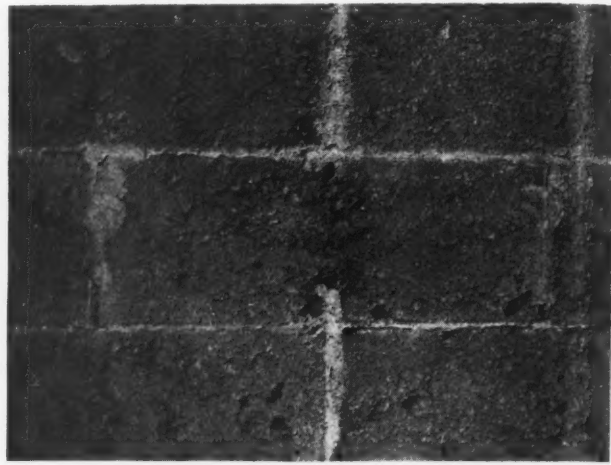


Fig. 1. Example of a Concrete Surface Laid Up as a Base for Stucco. Such Surfaces Are Remarkably True to Plans and Quite Uniform as to Mechanical Bond and Absorption.



Fig. 2. Bungalow of Concrete Block and Stucco Construction, of Which Fig. 1 Is a Wall Detail Before the Stucco Was Applied. Only Two Coats—a Scratch Coat and a Finish Coat—Are Required on the Average Concrete Block Surface.

"stucco" block" possess all of these characteristics to a remarkable degree, being made thruout of a mixture containing coarse particles producing a rough texture surface and being cast in steel mold boxes, so that each block face is a perfect plane.

Here are some suggestions for mixing portland cement stucco and handling stucco work on concrete block, arranged in the form of sixteen "stucco don'ts":

1. Don't trust important stucco work to inexperienced workmen.

3. Don't neglect to mix sand and cement thoroly before water is added and again thoroly after water is added. If possible, use a machine mixer.

4. Don't mix larger batches than can be applied in 30 minutes.

5. Don't retemper mortar. Throw away any mortar that has begun to harden before using and mix a fresh batch.

6. Don't neglect to measure proportions accurately and don't change them. Use the same proportions for all batches of one coat. One sack of cement to three

(Continued to page 114.)



Fig. 3. An Apartment Building with Concrete Block Walls, Ready for Stucco Coats. These Block Afford a Rigid Base and Only a Minimum of Material Is Required for the Latter Operation, Since Wastage Is Small and the Coats May Be as Thin as Can Be Conveniently Applied.

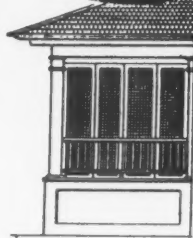
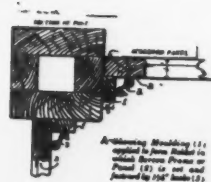
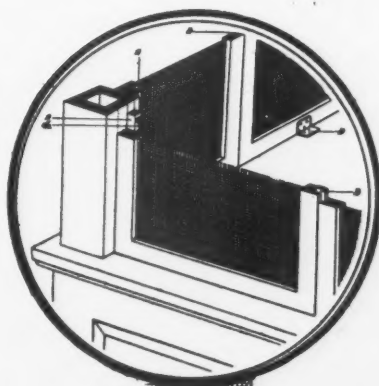
WINTER WORK FOR BUILDERS

Building Screens

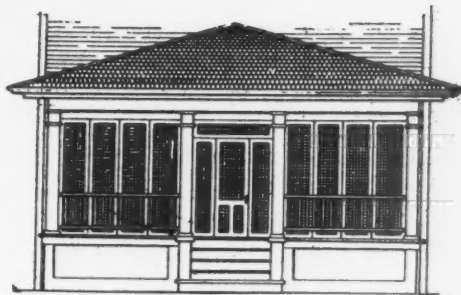
ANOTHER phase of winter work that should prove not only attractive but profitable to carpenters and contractors is making porch screens. If they wait until spring is actually here they may not be able to take care of all the orders because of the busy program in other lines. Why not start right now making those screens and canvassing your friends and customers for orders? The home of today invariably has a porch which is screened in during the summer months. The advantages of out-of-door living rooms have been recognized by most people and the demand for the open sleeping porch or sun porch is practically universal.

Each one of these porches needs screens. New homes need them but there is a big field for this type of work in old homes which have been remodeled and a new porch added. Many homeowners, for obvious reasons, have found it necessary in the past to delay building and ordering necessary porch

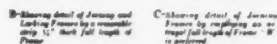
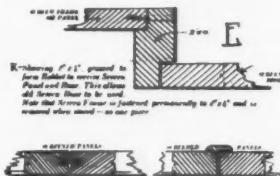
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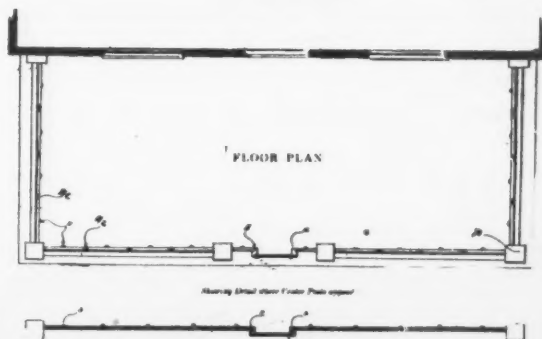
END ELEVATION



FRONT ELEVATION



D-CORNER BRACKET for fastening screen to frame



SCREENING DETAIL SHOWS FRAME PANELS ATTACHED



Healthful Sleeping Quarters for the "Kiddies" Made Possible by Screened-In Porch. These Panels Can Be Made During the Winter Time by Carpenters and Builders. Details Above.

Making Summer Profits in Winter Months

HOW TOM HIGGINS, JOB CARPENTER, KEEPS BUSY DURING THE DULL WINTER MONTHS

By S. P. Irwin

I HAD spent less than a day in the little town of Griffith, Indiana, before I heard the expression, "busy as Tom Higgins."

"And who," I queried, "is Tom Higgins?"

"Higgins," said my informant, "is a job carpenter, contractor and builder. If you want to build a home, Higgins will get you plans, figure on the job and take everything off your hands. If you want a poultry house, Higgins will build it. If you want to remodel or repair, Higgins is the man. In fact, Tom does so many things and is on the jump so much of the time that the expression, 'busy as Tom Higgins' has developed into a local by-word."

I went to see Tom Higgins next day.

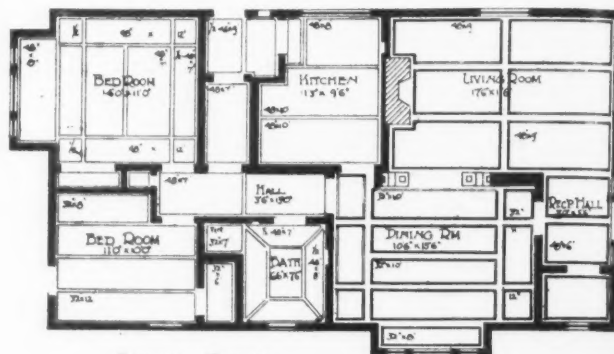
"Higgins," I said after I had located him in his little shop figuring on some job, "they tell me you're a busy man. Let me in on the secret. What do you do in the winter time aside from figuring on plans for spring?"

Higgins laughed.

"It's a secret," he said, "but as long as you're not apt to start up in competition, I'll let you in on it. Wallboard is the answer."

"Sure, wallboard—but there's not enough of that to keep you busy."

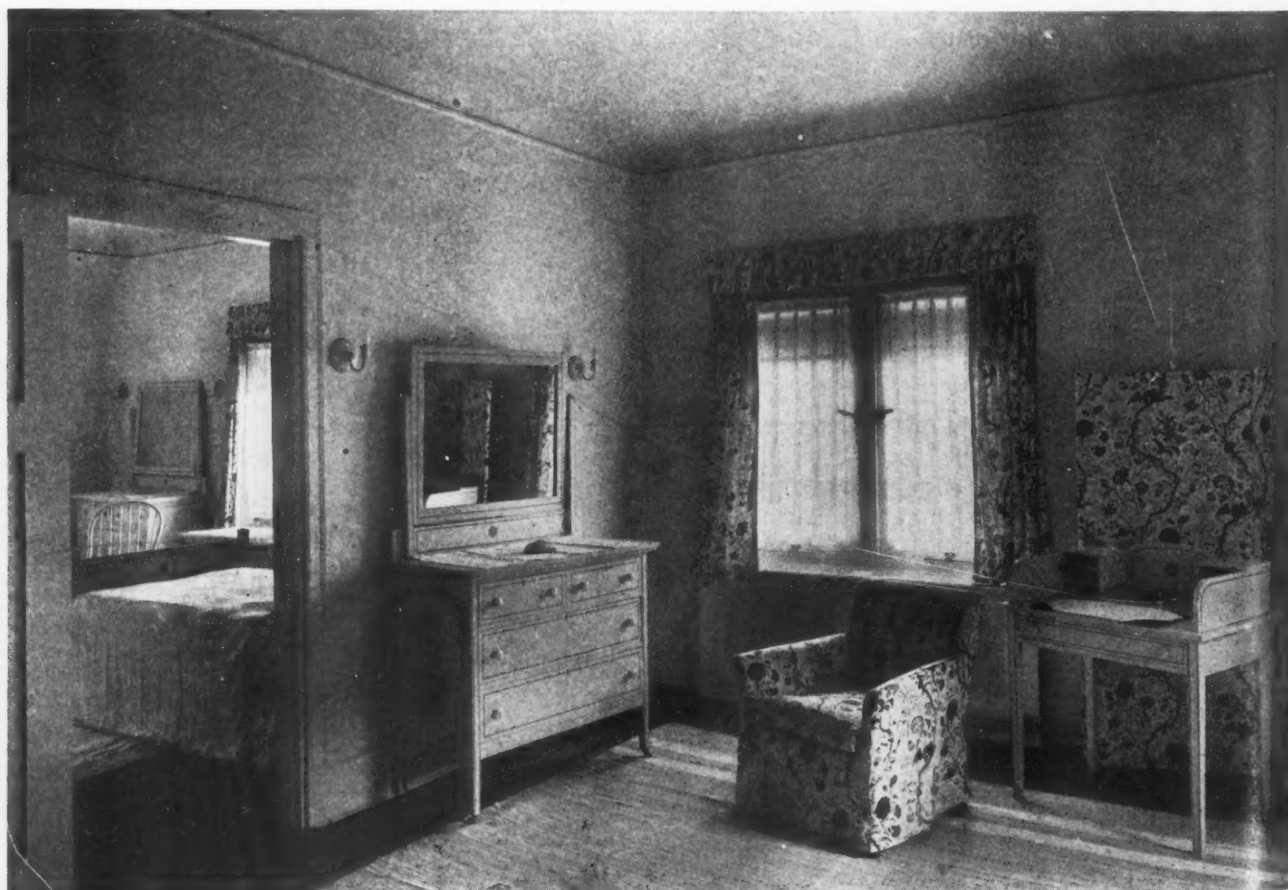
"Isn't there?" laughed Tom. "Well, that's just where you're wrong. For your information, let me tell you there are fifty-one and more possible indoor jobs that can be done with wallboard, and there are



Ceiling Plans of Home Showing Sizes of Wallboard Panels to Be Installed and Location of Beams. The Wallboard List for This Plan Calls for One Piece 32 by 6, One Piece 32 by 7, Two Pieces 32 by 8, Four Pieces 32 by 10, Five Pieces 32 by 12, Four Pieces 48 by 6, Seven Pieces 48 by 7, Three Pieces 48 by 8, Seven Pieces 48 by 9, Two Pieces 48 by 10 and One Piece 48 by 12.

two distinct kinds of wallboard—plaster board and wood fibre board—with which to do them.

"With wallboard, the big thing is to figure out the jobs that can be had, then go sell them. Attics, for example. Here's an attic job I'm sketching up rough



Bedrooms Finished with Plaster Wallboard. In the New Home the Use of This Material Does Away With Paneling.



Attic Which Has Been Remodeled Into Bedroom by Using Some Wallboard and Panel Strips. Waste Space Has Been Converted Into Large Bright Double Room at Little Expense.

plans for now. I'm going to put in this room for Mr. Maxwell, the president of the bank, and I'll tell you how I got the job.

"Mr. Maxwell has a boy in high school, about seventeen years old. I know the boy pretty well and this fall I noticed he had taken to dropping in the pool room down the street and I heard he was spending considerable time and money there. Finally the local gossips had it that he had quarreled with the old man and that his father had forbid him to go into any of the pool rooms again.

"I put that information in my hat and remembered it. Next time I dropped into the bank I made it a point to see Mr. Maxwell. He owns a fine big home up on the hill.

"Mr. Maxwell," I said, "isn't it about time you were fixing up that attic up at your house? Do you realize that for less than \$100 I can build you a fine finished room up there that will make an ideal billiard room, bedroom or maid's room?"

"Why not a billiard room? It's a mighty good sport and your whole family will enjoy it?"

"Maxwell hardly hesitated a min-

ute. 'Tom,' he said, 'draw me up some rough sketches to show me how the place will look and let me have your price. I think I'll let you finish the room for me as soon as you can get to it.'

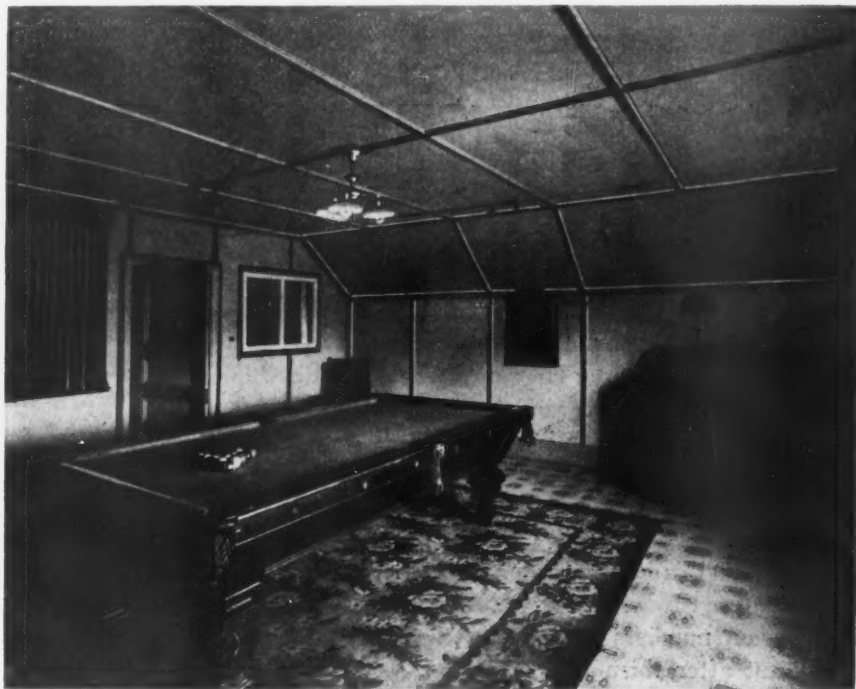
"That's just one wallboard job I have on hand now. There are dozens of others I'll get either this winter or next. Why, man, do you realize there are over a hundred autos in this little town and every one of them must be housed? Every year about this time I get a list of all these car owners and check over the fellows who own their own homes. Then I start calling on them.

"Why have your car in a cold, unlined shed that lets the air thru like a sieve, I ask them, when for a few dollars I can finish it with wallboard and make it a warm comfortable workshop. I always get several garage jobs that way.

"Then of course there are dozens of people in this town who haven't anywhere near as large a home as the Maxwells, but who still have room enough for an extra bedroom in the attic. I call on them and show them pictures of other wallboard bedrooms and that brings me more work.

"If you'll look around as you go into the stores in this town you'll be surprised at the number of wallboarded ceilings you'll see. That's because I've sold them on the idea. What's the use of having a dull dingy ceiling that darkens the whole place and discourages people who come in to buy something, I ask them. Let me put in a permanent ceiling of wallboard. It'll cost you far less than metal; and jars and vibrations will never make it fall. Most of them tell me to go ahead and do the work.

"Store windows are another hobby of mine. When

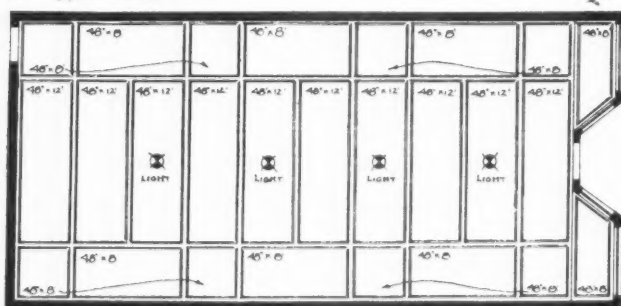


Another Use for an Attic. Carpenters Can Suggest Many Ways of Converting the Waste Attics in Homes Into Useful Rooms During the Slack Months of the Winter. Here Is a Billiard Room.

I'm pressed for work I take a few pictures of wallboard window backgrounds and go out to see the store-keepers. I point out what a difference an attractive background makes in the appearance of their whole display, and I sell them on the idea of using them. I make those right here in my shop.

"Some people, of course, object to wallboard on the grounds of not liking paneled walls and ceilings, etc., and there's a point most builders overlook. With plaster wallboard in ceiling high sections on the market there's no reason why a wallboard job should get away from you simply because the home owner doesn't like panels. You can build him walls and ceilings that can be papered or painted, just like plaster, but that have it all over plaster because they will never crack or crumble.

"Nearly every fall I have one or two houses nearly completed when the weather gets cold. In the old days we had lots of trouble with plaster in those cases. Now I simply show the owners that a plaster wallboard room can be finished just as any plaster room and that the walls and ceilings are sure to last longer and be more satisfactory. In nine cases out of ten we finish up the houses in that way, have no trouble with freezing plaster, and do all the work ourselves instead of sharing profits with another.



Typical Ceiling Plan of Store with Wallboard Walls and Ceiling. Note the Arrangement of Panels and Sizes.

"My message to the builder who wants to avoid dull winter months," declared Higgins, "would be—develop the wallboard business in your community. And don't forget there are two kinds of wallboard—wood fibre wallboard which goes well for remodeling, and repair and plaster wallboards which are especially suitable for new homes.

"But have this in mind, too. These wallboard jobs must be gone after. They won't walk into your shop in sufficient numbers to keep you busy. You've got to go out after them if you want to get enough of them to make something worth while out of it.

"That's easily done, however. In my own case I simply write to the manufacturers for pictures of good

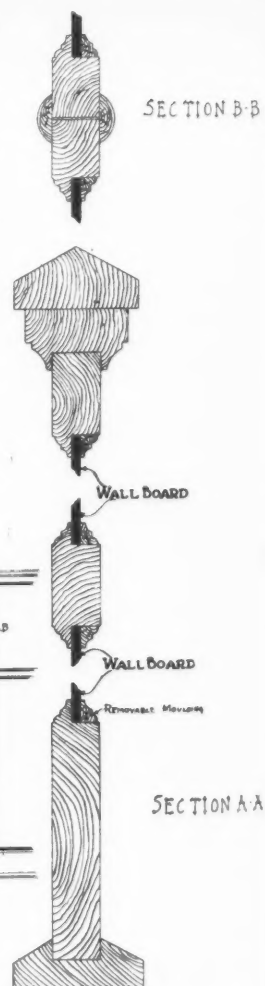
finished jobs and for booklets and folders with my name imprinted on them. I carry the pictures with me whenever I go to see anyone about wallboard and they usually help to close the deal. The folders I drop in the mail to people I plan to sell later. I find the manufacturers are glad to furnish me all this material I want free of charge, so I make good use of it.

"And that, in a nutshell," concluded Higgins, "is the way I keep busy during the dull winter months. I've touched on only a few of the many wallboard jobs I have done. Everything from club rooms to summer cottages is in my line and there are few of them that I haven't tackled at some time or other in my experience."

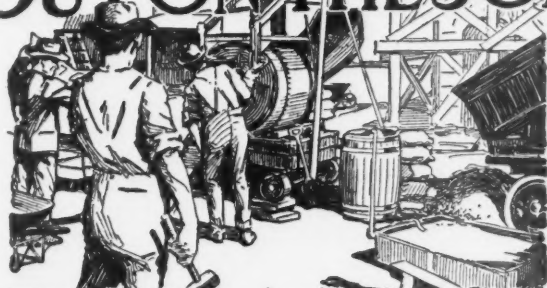
And Tom Higgins, one of the busiest men in his town, began to add up his material estimates on a basement play room he is going to finish for one of the local churches.



Store of H. B. Moore, Buffalo, N.Y., Finished with Wallboard. The Simplicity of the Design Is Very Effective and of Course Economical.



OUT ON THE JOB



What Builders Are Finding Good

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Hot Water Comfort in the Modern Home

Practical Directions For Installation of Range Boiler With Explanation of Theory Involved

IF the Indian who, visiting New York for the first time, marveled more over running water from faucets than he did over skyscrapers, what would he do if he saw hot water coming from the same faucet?

Yet that is what we have become accustomed to, and in the modern home, running hot water is necessary. A system of hot water supply consists of two parts, first the water back in the ordinary stove and range boiler, or the water heater and storage tank in connection with the heating plant; second, the system of distributing pipes thru which this hot water is conveyed to the various fixtures. Each of these two parts possess a circulation system thru which water is constantly circulating and the principles covering the installation of both are practically the same. There is enough difference, however, to call for a separate explanation.

To the average builder much of this explanation will seem superfluous, as he is not interested in theory. But a general knowledge of the working of the system will prove invaluable to him in making the hot water system as effective as possible for his client.

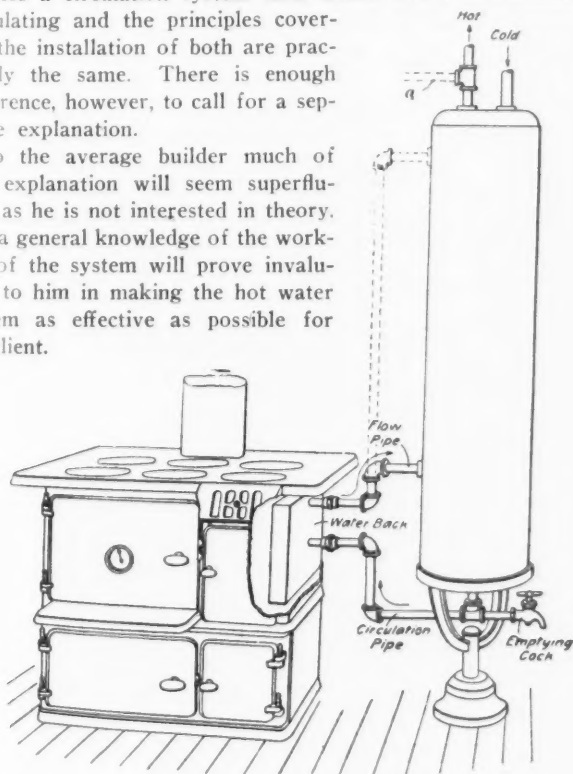


Fig. 1. Range with Waterback Connected with Range Boiler. The Boiler Can Be Tapped at the Bottom or Top as Indicated by Dotted Lines.

Fluids like water can be heated only by circulation. Conduction will convey the heat to a vessel containing water and the heat will then be absorbed by a thin film of water in contact with the heating surface. Unless this film can circulate and mix with other water, the water in the vessel will not become heated. This fact can be demonstrated by heating a vessel from the top. But, on the other hand, if the heat is applied from the bottom the warm water will rise to the top, causing the cold water to take its place, and thus causing a continuous circulation in the vessel.

The difference in weight between two volumes of water of different temperatures which sets up local circulation in a vessel will likewise set up a circulation of water in a closed circuit and it is due to this fact that water can be heated and stored for domestic use.

The connections between a range boiler and waterback can be seen in Fig. 1. In this arrangement the water is heated in the waterback and circulates thru the boiler, the colder water flowing to the bottom of the boiler and out to the waterback where it heated. By this circulation the entire contents of the boiler become heated.

Under ordinary conditions a standard waterback will heat from ordinary temperatures to 200 degrees F. from 25 to 35 gallons an hour for each square foot of exposed surface. Since the average waterback is not quite this large, it will heat to boiling point about 17 gallons an hour.

In homes which are equipped with basement heating plants the heat is utilized to heat water in a range boiler. As the furnace of heating plant is operated only during the cold weather it is necessary to have some other means for heating the boiler during the summer months. This calls for a double heater connection with the boiler. In Fig. 2

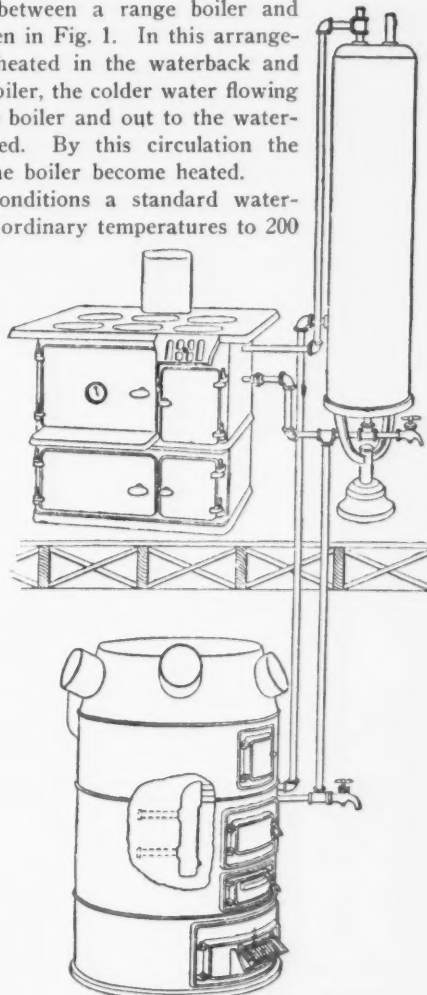


Fig. 2. Range and Warm Air Furnace Connected with One Range Boiler. This Insures Hot Water the Year Round.

a range and hot air furnace are connected to one range boiler. Each connection is independent of each other which is a precaution that will avoid trouble. In a case like this the boiler should be of greater capacity than when connected with only one heater.

Tank heaters are also used quite extensively. These heaters are generally placed in the basement and connected up with the boiler along with the coil in the furnace. Gas water heaters are also used for this purpose, or another method is to build the heater right into the boiler. Here the flame of the gas is applied to a spreader filled with cold water and the surplus heat passes over the bottom of the boiler and up thru a flue.

Hot water pipes which are extended any great distance to

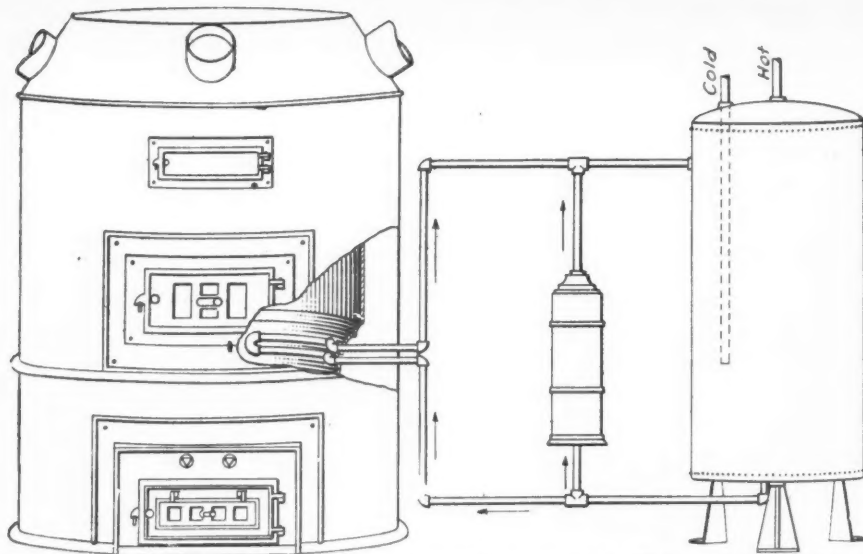


Fig. 3. One Method of Connecting Gas Heater to Storage Tank. This Heater is Used to Heat Water When the Large Plant Is Not in Operation.

a fixture or group of fixtures should be provided with a circulation pipe thru which the hot water can circulate and thus be close to the faucet at all times.

Range boilers used for domestic water supply should have capacities of not less than 30 gallons. In the case of a smaller boiler, which is very often installed in large apartment buildings, a very hot fire will cause the water to boil unless some is frequently drawn off to reduce the temperature. In the selection of the proper size of range boiler to be used, the factors to be taken into consideration are the amount of water that will be used daily, and the duration of time in which it will be used. If water is used uniformly thruout the day a 30 to 40-gallon boiler will be satisfactory for the average family of two to four people. If, however, the water is drawn off intermittently with long intervals between drafts or if more than one bath is to be taken in the period of an hour or so, a larger boiler should be used to store the water.

The following table will enable the architect, builder or plumbing contractor to select the size he needs:

| | | Size of Boiler | |
|----------------|------------------|----------------|--|
| Size of Family | No. of Bathrooms | (Gallons) | |
| 2 | 1 | 30 | |
| 2 | 2 | 40 | |
| 3 to 4 | 1 | 40 | |
| 3 to 4 | 3 | 52 | |
| 5 to 6 | 1 | 52 | |
| 5 to 6 | 2 | 66 | |
| 5 to 6 | 3 | 82 | |
| 6 to 8 | 1 | 66 | |
| 6 to 8 | 2 | 83 | |
| 6 to 8 | 3 | 100 | |



Spanish Tile in Modern Form

BACK in the days of the Franciscan monks of California, they built all their missions and houses with Spanish tile roofs, made of clay. Today that same effect is being reproduced in metal, either painted or galvanized re-dipped tin plate or copper, with very satisfactory results. Many builders, particularly in the east, have found this type of roof in demand.

The process of laying is not at all difficult nor complicated. In laying a roof with Spanish metal tile care should be taken to run the courses straight—this applies to both horizontal and vertical lines. This can be readily done with a chalkline and will insure true

lines. The squares must be true. All horizontal lines running at a right angle to the perpendicular lines and true with the eave line of the room.

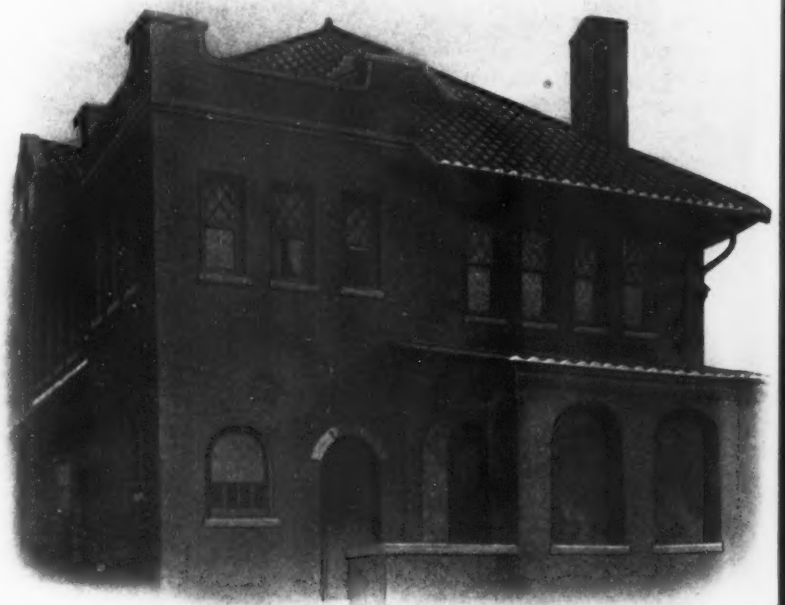
Begin at the left side of the room and work to the right. Nailing flange is on the right side and two nails should be driven thru it to hold tile to roof, one about three inches from bottom and one near top end. In finishing to valley or gable finish, the connection should be made by soldering. It is not necessary to solder a solid seam. Heavily tacked every three inches would answer all requirements. This also applies to the ridge hip finish, etc. The tile should lap over the lowest corrugation at top of the tile beneath it. In finishing to valley cut tile to the same mitre line as valley and solder in headers. It is advisable to use waterproof paper underneath the tile.

This metal tile is fitted with a special lock which prevents water from entering beneath.



Whitewash for the Home

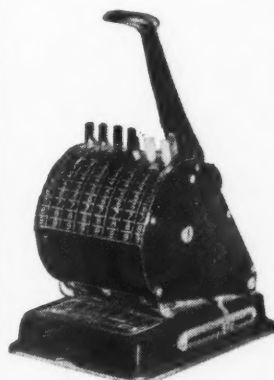
WHITEWASH is of a value both as a disinfectant, and also because of its color. It acts as a preservative for wooden structures, and if properly prepared is a fire retardant. A dark and gloomy cellar may be made bright and clean by the use of whitewash. Cellar steps, beams, and other obstacles which frequently cause trouble should be covered with whitewash, which will serve to call them to attention, thus avoiding accidents. On small buildings about the lot as well as trees and fence posts, whitewash can be used to advantage as a means of improving their appearance, and also to some extent reducing attacks from vermin. The National Lime Association has prepared an interesting bulletin on the subject of whitewash, which will be sent free upon request.



View of Home with Roof of Metal Spanish Tile. This Tile Is Made of Copper, Painted or Galvanized Tin Plate.

Device to Protect Checks

EACH year there is approximately \$30,000,000 lost from check frauds and most of this loss is caused in check raising. This practice has increased with leaps and bounds because it is easily done. To stop this practice and protect the man who writes the check a mechanical check protector has been devised which is now available for a very small price. Many contractors who write out pay checks every week will find this device a protection.



Machine For Shredding Amount in Checks.

This device writes the exact amount in figures in the body of the check. Each figure is shredded thru the paper and indelible ink forced into the shreds. It is then impossible to raise the amount of the check without instant detection.

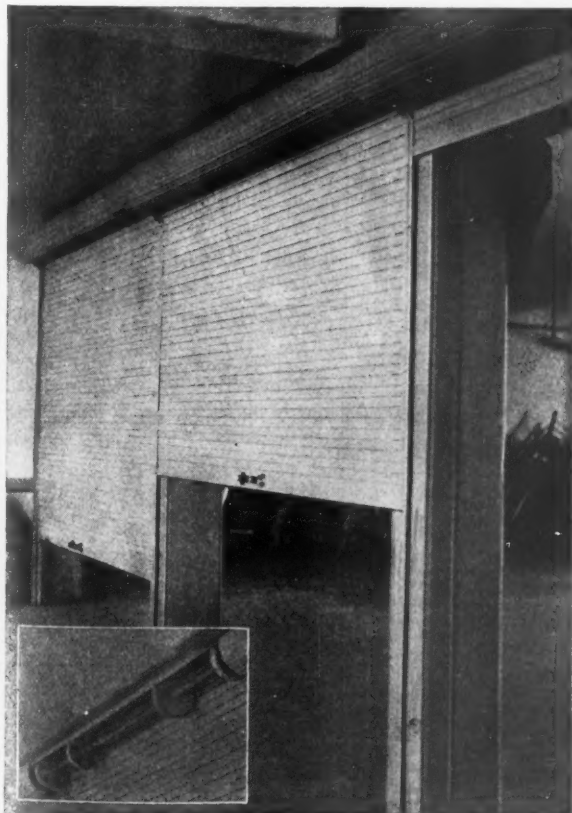
Since more than 95 per cent of all business is transacted by checks and drafts and very little by actual cash, unprotected checks are one of the most inviting forms of easy money. If your checks are raised you are the loser.



Rolling Partitions Between Rooms

HOW to make two rooms into one or one into two quickly is a problem that is easily solved by the use of the rolling partitions shown below. These partitions are used in churches, schools, club houses, hotels, factories and in residences and afford many convenient combinations in room arrangement.

For instance very often a school building is not large enough to permit the luxury of a special auditorium or hall. The space must be used for class rooms. By installing these moving partitions between these rooms, they can be readily



This Illustration Shows Several Sections of Rolling Partition, One Section of Which Should Not Exceed 12 Feet in Width.

changed into a large open room when the partition is raised. They are attached to fixed posts or in the case of wider openings movable posts can be used as guides between partitions. These posts can be detached, the partitions coiled away and the room made into one large space.

This rolling partition is made up of wooden slats 1 3/4 inches wide and 3/4 inch thick, fastened together in a sheet. This sheet or curtain is coiled away by means of a spring roller like that shown in the illustration.

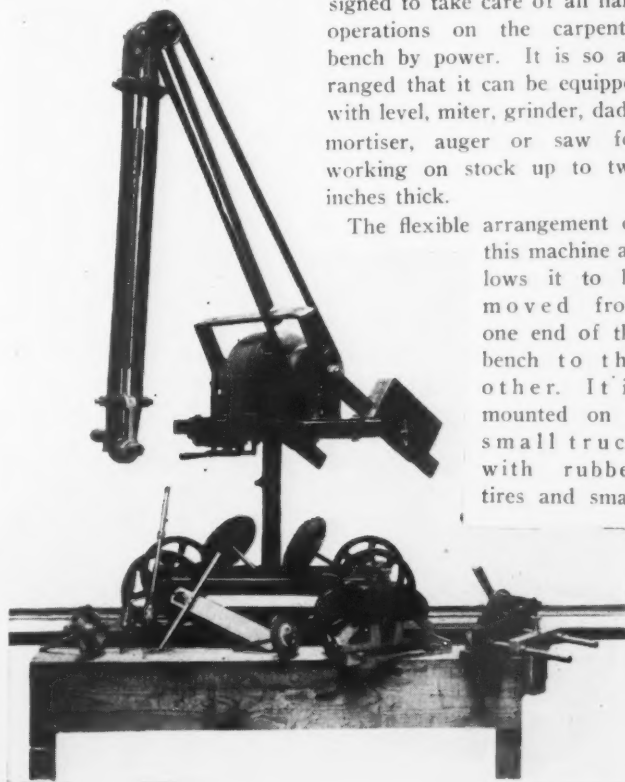


Small Carpentering Machine for Woodworking Jobs

FOR those who are constantly working on wood of all kinds, such as carpenters, cabinet makers, builders, etc., the machine shown here will be of more than usual interest. This small carpentering device is designed to take care of all hand operations on the carpenter bench by power.

It is so arranged that it can be equipped with level, miter, grinder, dado, mortiser, auger or saw for working on stock up to two inches thick.

The flexible arrangement of this machine allows it to be moved from one end of the bench to the other. It is mounted on a small truck with rubber tires and small



Small Machine for Performing Ordinary Hand Carpenter Bench Jobs. It Can Be Moved from Part of the Bench to Another and Has Several Kinds of Equipment.

handle. The long arm can be fitted with special devices. The machine is operated by an electric motor mounted on the truck.



Quick Way to Find Cuts

To the Editor:

Remington, Ind.

In your September number F. M. Williams, secretary Pensacola Builders' Exchange, Pensacola, Fla., asks what figures to take on the square to get the plumb and side cuts of jacks in a 1/4 or 1/3 pitch roof.

In answer will say for 1/4 pitch roof, take 12 on the blade and 6 on the tongue. The tongue gives plumb cut and blade give seat cut of both common and jack rafter. For 1/3 pitch take 12 on blade, 8 on tongue. The tongue gives plumb cut, blade seat cut for both common and jack rafters. For either (or any) pitch, take 12 on tongue and the length of common rafter on blade, the tongue giving side cut of jacks.

C. W. HARNER.



Our Readers are Requested and Urged to Make Free Use of These Columns for the Discussion of all Questions of Interest to Carpenters and Builders

Method for Constructing Parabola

To the Editor:

Kewanee, Ill.

An easy method of constructing a parabola when distances AB and OC, Fig. 1, are given, is outlined below.

Divide the distance AB into any convenient number of equal parts, numbering these division points consecutively, beginning with zero, forwards and backwards. Underneath these numbers place the product of the two numbers in the vertical rows as shown. These products indicate the ratio of the vertical distances between line AB and the curve to the total height OC. In Fig. 1 the distance AB has been divided into 10 equal parts, the division points numbered and the products placed as explained above. Then if distance OC represents 25 equal parts which is the product shown at the line OC, the other products indicate the number of parts vertically between that division point on line AB and the curve. The following is a proof of the above.

The curve of bending moments for a beam supported at both ends and uniformly loaded is a parabola and distance OC in Fig. 2 represents the maximum bending moment

$M = \frac{Wl}{8}$, and AB the length of the beam l in inches. The

bending moment at any distance x from the support is given by the formula,

$$M_x = \frac{Wx}{2} \left(l - \frac{x}{2} \right)$$

Assuming the following values $W=1,000$ lbs. and $l=80$ inches, $M = \frac{1,000 \times 80}{8} = 10,000$ in. lbs. Dividing the dis-

tance l into 10 equal parts, numbering these division points and placing the products as in Fig. 1, the maximum bending moment represents 25 equal parts or 400 in. lbs. for each part. Assuming the distance x to reach the division point marked 3 and multiplying the product 21 shown at that point by 400, we get 8,400 in. lbs. bending moment. Distance 7 in the above

would be $\frac{80 \times 3}{10} = 24$ inches. Then the bending moment at

the distance x from the support using the formula would be

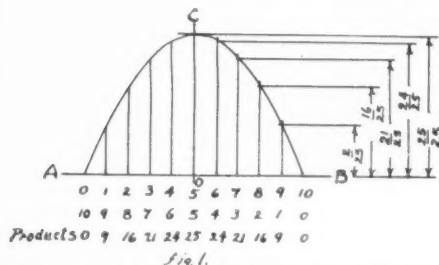


Fig. 1. Distances OC and AB Given to Construct Parabola.

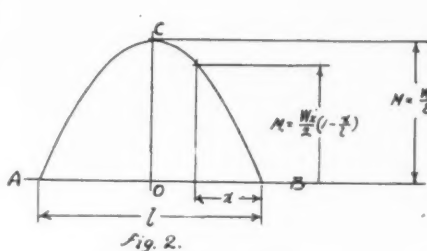


Fig. 2. Showing Maximum Bending Moment and Length of Beam.

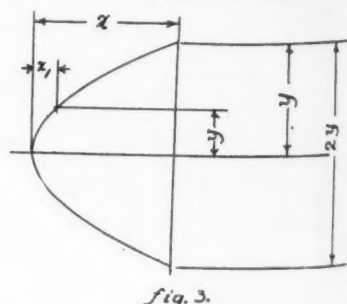


Fig. 3. Graphic Explanation of Formula for Parabola Equation.

$$M_x = \frac{1000 \times 24}{2} \left(1 - \frac{24}{80} \right) =$$

8,400 in. lbs., which corresponds to the above result.

Another proof:

The equation of the parabola, origin at the vertex O, is $y^2 = 2px$. From the foregoing example y in Fig. 3 = 40, $x = 10,000$. Then $p = \frac{y^2}{2x} = \frac{40^2}{2 \times 10,000} = .08$. Making $y - y_1$ in Fig. 3 equal to x in Fig. 2, $y = 40 - 24 = 16$ inches, and $x_1 = \frac{y_1^2}{2p} = \frac{16^2}{2 \times .08} = 1,600$. Since M_1 in Fig. 2 equals $x - x_1$, in Fig. 3, $x - x_1 = 10,000 - 1,600 = 8,400$ in. lbs., which corresponds to the previous answers.

FRANK SZABO.

How Can He Clean Brick?

To the Editor:

Cincinnati, Ohio.

I would like to get some information on how to clean brick. I have bought a lot of brick from the government. They were used in the acid kiln at the nitrate plant. They were laid in silicate and oil, when they were torn down a stream of water was let run on them. As the mortar was not water-proof they were washed clean, but they look as if they were whitewashed.

As the mortar is strictly acid-proof acid will not take it off and washing in water does not seem to improve them either. The brick are cherry red, hard and non-porous.

Perhaps a case of this kind has come to your attention before. I would like to use them on an outside face.

JOHN E. MOHR,
3218 Warsaw Ave.

What Do You Know About This?

To the Editor:

I have been having arguments concerning the proper way to put on German siding and would like to have your opinion and authority on it. Should it be fitted to casing and corner boards or should the corner boards and casing be put over it?

CHAS. T. PASCOE.

Builds Attractive English Cottage

To the Editor:

West Jefferson, Ohio.

I am sending photograph and floor plans of an "English cottage" I recently completed here. It is quite attractive and the surroundings are beautifully landscaped. The plans were drawn by Donald Sheets, a rising young architect of this town, and the house was built by me for his father, Sherman Sheets.

There are many features about it that will interest my brother readers, especially the asphalt shingle roof in two-tone effect, brown and green, green predominating. This roof has attracted considerable favorable comment in this vicinity.

The house is frame and stucco with a large porch at the side. The basement, as the plan shows, has been divided up very efficiently into coal cellar, furnace room, laundry, cold cellar and general room. The walls are concrete and the floor is concrete with plenty of drains at various points. I think the interior arrangement is a very good one with large living room, 15 by 25 feet, brick fireplace, dining room, kitchen, sunparlor and one bedroom on the first floor and two bedrooms, studio, and dressing alcove on the second floor.

FRANK L. OLNEY.

each reader to estimate the cost of each building illustrated in your paper at his own home, at the prevailing prices then in force at the place he lives.

What I mean is if you would say, it will take so many 100 pounds cement, so many yards of sand, so many common brick, so many feet of lumber, so many feet finish lumber, etc.,



Basement and Upper Floor Plans of Cottage Shown in Illustration Below. It is Frame and Stucco.

Wants Bills of Materials

To the Editor:

Sweeny, Texas.

In your November issue of the American Builder, I read the letter of E. J. O'Hara, and your reply with interest. I think it is a fact, that possibly the largest percent of your readers are somewhat of the same opinion as Mr. O'Hara, that is at least, the contractors.

Now the suggestion I have to offer is this: If you would furnish a material bill with each plan it would be easy for

to build the above house, then it would be easy to compute prices as they then prevail in their own home town or market. You could also state the different sizes of windows and doors and put them in your plans at list prices.

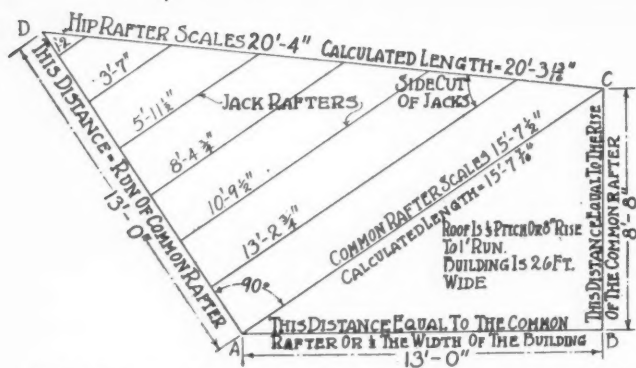
I do not see any reason why you could not give an estimate of labor required to build each house, say, so much mason work figured at so much per hour, so many yards of plaster at so much per yard, so many yards of stucco at so much per yard, so many days carpenter work at so much per hour, then it would be an easy matter to compare your prices quoted by the prices for the different kinds of labor then prevailing at the different homes of your readers.

This would be a great help to all your readers. I know from experience.

L. W. ENGBERG.



Charming English Cottage Built By Frank L. Olney from Plans Drawn By Donald Sheets, a Young Architect in West Jefferson, Ohio. It Has Many Interesting Features, Including Sun Room, Studio, and Modern Laundry in Basement. It Is 42 Feet 6 Inches by 26 Feet.



Sketch Showing Short Cut to Obtaining Roof Cuts, Submitted by L. Fieg.

Short Cut to Roof Cuts

To the Editor:

Oneonta, N. Y.

I also agree with W. A. Brown, whose letter in your October issue of *AMERICAN BUILDER* declares that many of the methods given for finding lengths at hips and jackrafters and their cuts are too technical for most of us to understand. Enclosed is a sketch showing an easy way to get lengths and cuts. The sketch for any roof is easily drawn on a piece of wallboard to a scale of 1 in. to 1 ft. Draw the line A—B equal to one-half the width of the building or the run at the common rafter. Draw B—C at right angles to it equal to the rise of the common rafter. Connect A and C. This line represents the common rafter. Now draw A—D equal to A—B or the run of the common rafter and at right angles to A—C. Connect D and C. This represents the hips. Now draw lines parallel to A—C, the common rafter at whatever spacing is required. These lines represent the jacks and are scaled to get the respective lengths. The side cut for the jacks can be taken off with a bevel as shown, the foot and plumb cut being the same as for the common rafter. The diagram A-C-D-A is a view of the roof normal to the slope. This method works for any pitch.



L. FIEG.

How to Use Square for Mitering

To the Editor:

Mr. Cecil Prosser wants to hear from some one who has had experience in plastering on concrete blocks. I am a cement products booster. Not that I am getting any revenue from it but because I firmly believe it is the best there is. Mr. Prosser says he has a continuous air space from foundation to plate. If he has and all his trim stone is of the two-piece type, he will have no trouble with damp walls from moisture from the outside. I have finished several jobs of this kind and have no trouble at all. I say, I don't care what kind of material is used, if there is a continuous air space, there will be no danger of moisture from the outside. What about a frame building? No doubt Mr. Prosser knows of houses being built with just the weather boarding or siding just nailed on the studs and then lathed and plastered on inside. No one ever questioned that this was a damp house from the standpoint that moisture could get in from outside. Yet we all know that dampness got in through the siding. The air space saved the building or it would not have been fit to live in. We can plaster right on the inside of a solid wall and not get dampness from the outside. I mean by this we can waterproof and weatherproof our walls so that no moisture can penetrate. Then why are our walls damp? It is just a plain case of capillary attraction. The air space breaks this and prevents damp buildings. A house that is not planned with good ventilation and circulation of air is going to be more or less damp. In regard to a block wall being better than solid concrete, I would say no, unless it was a wall with continuous air space and it would be only

better in that it would be dryer. Conditions would vary this also. A solid wall would be stronger with the same proportions. If I were building a block wall or solid concrete wall for a house and it was necessary to keep out moisture I would use some method of waterproofing. In referring back to plastering, I have been using cement plastering. We like it much better and if anyone wanted to, they could turn a hose on it to cleanse it. It can be finished up the same as any other and some kind of finish it will take better. We did one job where we molded the casings and base out of cement plaster. We are believers in permanent construction.

In answer to A. J. Ebert's question I have never had any experience with a log house but I have had some with magnesite stucco. I have put on several different kinds of magnesite stuccos. It will work all right in the way he has it planned if he has a building that is solid and has a good foundation under it. I would never stucco a building that does not have strength in both foundation or in building. Whenever a building shrinks the stucco is going to show cracks. If I had Mr. Ebert's proposition, I would put on metal lath and use a good cement stucco. He could get a self-furring lath and have a much more permanent job and as for finish he can get finishes in cement stucco that can't be thought of in magnesite stucco. I am not a knocker on magnesite stucco for I know it is good, but I believe from a permanent standpoint that cement stucco has it beat. I know that it takes a man that understands the situation to make a success of this line of work.

I know if we all loosen up a little and tell each other some of our experiences and troubles that we can help each other a great deal.

A. L. BENSHOOP,



Solution for Arc Problem

To the Editor:

Nebraska City, Nebraska.

I noticed in the September number that L. W. Callaway of Eureka Springs, Arkansas, would like a formula for finding the distance around an arc from the length of its chord and versed sine, and then in the November magazine a Mr.

Bernard Pepinsky worked this problem but said that he could not give any formula that would give the length of the arc directly. I am inclosing my shorter way of working this problem and also the formula.

bb is the arc. aa is the chord. c is the versed sine. d is the chord of half the arc.

To find the length of the arc of a circle when the chord and the versed sine are given:

$$\begin{aligned} 12 \times 12 &= 144 \\ 4 \times 4 &= 16 \end{aligned}$$

$$\begin{aligned} \sqrt{160} &= 12.65 \times 8 = 101.20 - 24 = 77.20 \\ 77.20 \div 3 &= 25.734 \text{ or } 25\frac{3}{4}. \end{aligned}$$

Rule for All Examples of This Kind

From 8 times the chord of half the arc subtract the chord of the whole arc and divide the remainder by 3 and the quotient will be the length of the arc.



AUGUST JOHNSON.

Wants to Know How to Repair Door Panel

To the Editor:

Jamaica, N. Y.

Some time ago I saw an article on how to repair door panels. Will you kindly let me know how to go about it?

C. E. HICKS.



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Attractive Brick and Tile House Built by H. L. Wolff, Contractor, Brook, Ind. This House Has Many Modern Features.

Builder Sends Picture of Work

To the Editor:

Brook, Ind.

I am sending you a photograph and floor plans of a fine home I recently built for one of the leading citizens of this community, L. E. Lyons. It is built of face brick with tile backing and is 40 by 38 feet. All of the white stone trim is white cement precast. The porch floors are composition and the roof is clay tile. There is a tile fireplace in the living room and a hot water system heats the house.

As you can see by the floor plan, the room arrangement is very efficient, seven rooms in all, four on the first floor and three upstairs. In addition there is a large sleeping porch on the second floor over the portecochere which covers the driveway to the garage in the rear. Off the kitchen is a small cozy breakfast nook with built-in furniture. Copper gutters and flashing were installed thruout. An open front porch 11 feet deep extends across the front of the house.

H. L. WOLFF,

Contractor and Builder.

Offers Easy Solution for Miter Cuts

To the Editor:

Selma, Calif.

I have been very much interested in the articles on the steel square and am sending you a drawing and if you wish to publish all O. K.

In this drawing is shown the relation of the square to degrees and how the figures are obtained for forming poly-

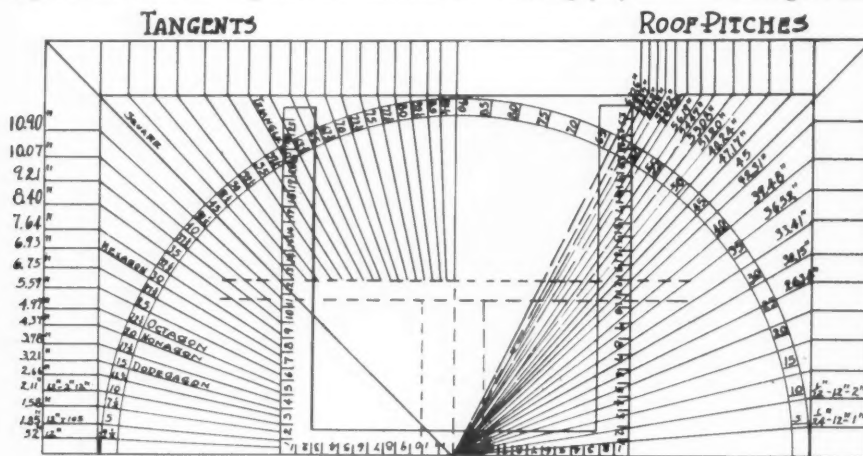
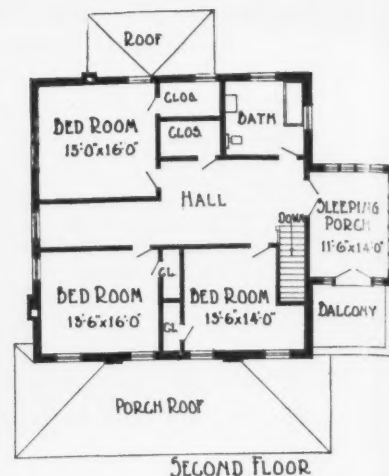
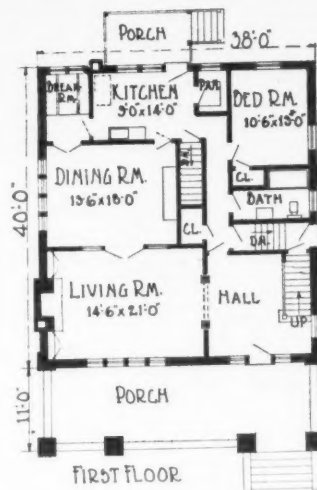


Diagram of Steel Squares in Position, Showing How to Get Miter Cuts and Angles.



SECOND FLOOR



First and Second Floor Plans of House.

gons or mitering pieces at different angles.

The polygon mitters from three to twelve sides are shown likewise, the figures to use on the square are marked on the margin. It will be observed that these figures are derived from the body of the square and are determined by a line drawn from 12 on the tongue to the degree mark corresponding to the miter angle.

A line drawn from 12 on the tongue of the square to the $22\frac{1}{2}^\circ$ mark on the circle passes thru the body at 4.97 inches.

As $22\frac{1}{2}^\circ$ is the miter angle for an octagon, then the correct figures to use in laying out an octagon are 12 and 4.97 inches; in other words, 4.97 inches is the tangent of $22\frac{1}{2}^\circ$.

On the right hand side is shown the roof pitches which needs no explanation.

P. C. STRIPLEY.

THE production of Douglas Fir alone in the two states of Washington and Oregon is nearly 20 per cent of the total lumber production of the United States.

TOTAL lumber production in 1920 for the United States was 2.2 per cent less than in 1919; 11.9 per cent less than in 1913, and 24 per cent less than in 1909.

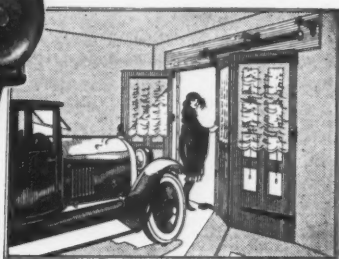
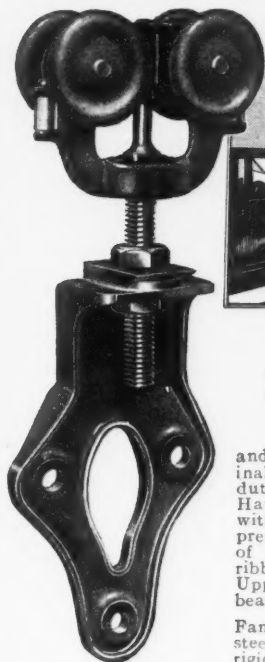
Three bulletins of interest to builders have just been released by the University of Illinois for distribution. They are "The Thermal Conductivity and Diffusivity of Concrete," "Studies on Cooling of Fresh Concrete in Freezing Weather," and "The Volute in Architecture and Architectural Decoration." These bulletins are available at twenty, thirty and forty-five cents, respectively.

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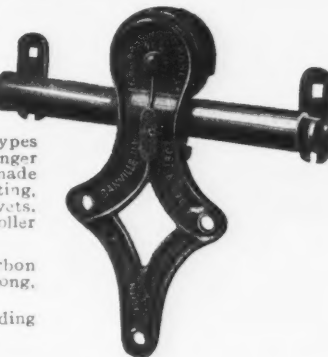
Famous No. 2 Round Track, finest high carbon steel; tube type with back slotted for strong, rigid malleable brackets.

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Type 1080 Hangers and Brackets are made of our own high grade malleable iron. Adjustable Hangers with roller bearing wheels and ball bearing swivel. Vertical guide rollers our own exclusive feature. Brackets adjustable-locking. Heavy gauge steel track with trough type wheel guides. Shipped in complete sets to specification.

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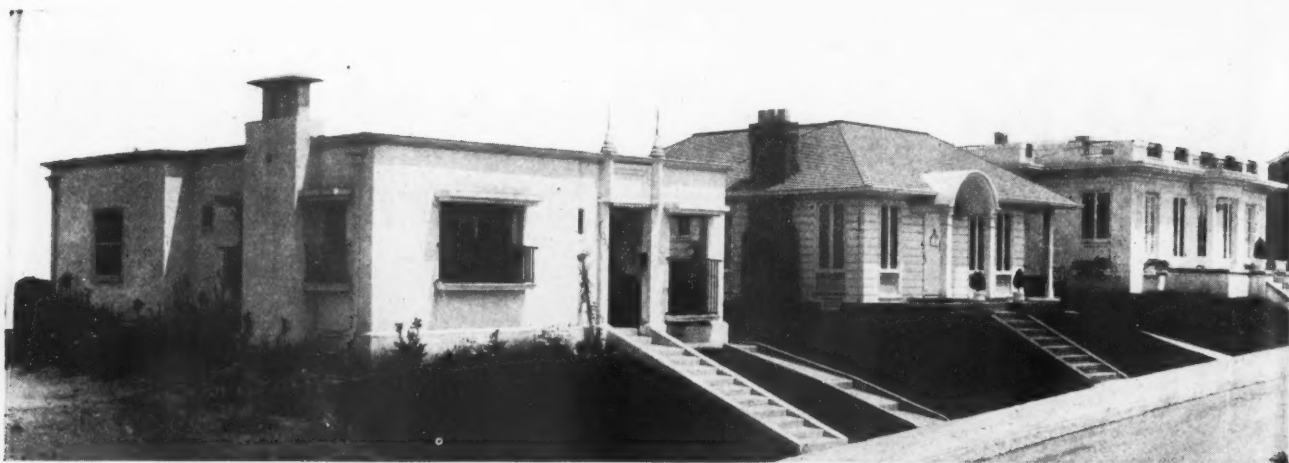
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Streets of Small Homes Which Perform Important Function in Our Order of Things. Many Small Homes Will Be Built Next Year by Families of Small Means Who Cannot Stand the Increasing Rentals and Restrictions of Apartment Buildings.

Application of Stucco

(Continued from page 100.)

cubic feet of sand is about right. Richer mixtures may craze. Lean mixtures will be porous.

7. Don't use more water than is absolutely necessary to produce a plastic mortar that works easily.

8. Don't apply stucco to dry block walls. Moisten the block before stuccoing.

10. Don't trowel stucco surfaces smooth. Use a wood float but not a steel trowel.

11. Don't work stucco coats more than is absolutely necessary. Keep mortar coats wet for several days. Apply water as soon as each coat has set enough so that it will not wash. Apply the stucco continuously—don't let it dry at the edges—run the second coat the day after the first coat. Roughen the first coat to give a better bond.

12. Don't apply finish coat until previous coats have been cured for at least one week.

13. Don't run stucco to grade line. Use 6 or 8-inch belt course of block at grade line and run stucco to belt course.

14. Don't omit overhang with steep wash and drip on all belt courses, water-tables, sills and other projections.

15. Don't put stucco on horizontal surfaces where water can collect.

16. Don't start your next stucco job until you have read the American Concrete Institute's "Recommended Practice for Portland Cement Stucco."

If you are interested in good stucco work, follow suggestion No. 16 by requesting copy of these specifications from the service department of the American Builder, or from the secretary of the American Concrete Institute, New Telegraph Building, Detroit.



Building Screens in Winter

(Continued from page 101.)

screens; others have failed to include this important item in their building specifications. They are the people the carpenter and builder should see right away.

The work can be done now and the screens installed later on thru the perfection of the unit panel, a sectional perspective of which is shown in the circle. These panels are built porch height as shown in the front elevation drawing, these panels resting on the floor, each a unit that locks together automatically by insertion of a wooden (spline) strip (see B).

These panels are fastened securely with hooks and corner brackets (D), allowing their installation or removal by one person in a very short time.

Specifications for making screen panels in brief are:

Lumber—Screen frame—door stock— $1\frac{1}{8}$ inch straight grained white pine. Moulding strips to form rabbet $\frac{1}{2} \times \frac{7}{8}$ inches with locking strip (spline) for screen frames of $\frac{1}{8}$ inch width or as selected.

Construction—Portable screen frames or panels not over 30 inches in width to rest on floor, either in front or behind porch rail and run to top as shown. Panels to be locked together by $\frac{1}{8}$ inch spline and these panels fastened to post with $\frac{1}{8}$ inch hook and anchored to floor by corner brackets. By unscrewing brackets at floor and unfastening hooks, screen panels can be taken down by anyone in a very short time and they are as easily put up.

Wire Cloth.

Hardware—Floor brackets and $1\frac{1}{8}$ inch hooks as shown in "D" and "A."



Additional Cold Weather Hints

IF snow is on the road, avoid formation of ice under motor truck wheels when stopping by releasing brakes just before coming to a stop and letting truck roll the last few inches.

To avoid spinning wheels, feed gasoline slowly and work clutch gradually. This is because there is less resistance on a slippery road and consequently rapid acceleration is neither necessary nor possible.

Do not forget that the amount of power necessary to start or stop a truck depends on the resistance or traction between the road and the rear wheels.

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A JOHNS-MANVILLE Asbestos Roof is a splendid, long-lived salesman, bringing in new roofing business for you year after year. And you don't have to pay it a salary, in fact Johns-Manville Asbestos Roofing pays *you* with profits that are immune to competition. No cheaper roofing can give nearly the same satisfaction.

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Write the nearest Johns-Manville branch for the details of our roofing sales plan. And remember that every job you do starts right in to get more Johns-Manville Asbestos Roofing jobs for you.

JOHNS-MANVILLE

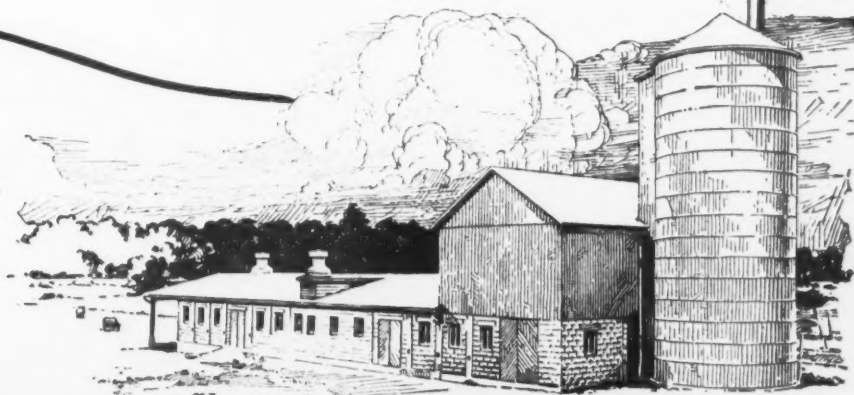
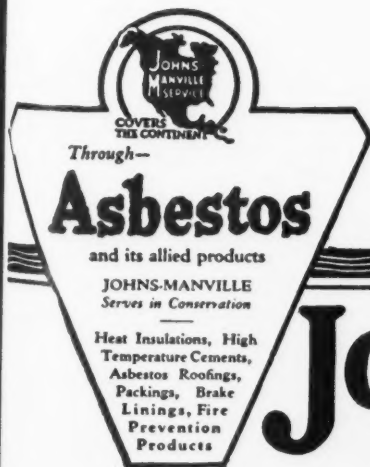
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Brick Bungalow of Merit

DESIGN MARKED BY SIMPLICITY AND STRENGTH—MODEST LINES INSURE ECONOMY IN COST

WHEN a client asks the builder to figure on a small brick home, he invariably is counting a home that will endure not only during his life but that of his children. Solid brick walls possess a certain reassuring appearance that makes them attractive to many homeowners.

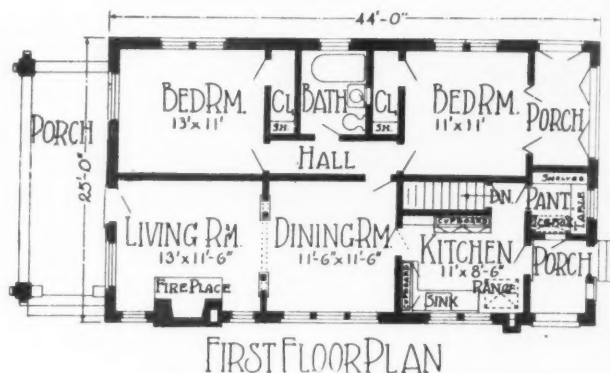
Economy and utility have been effectively combined in the charming well-built brick cottage shown here. The exterior has a snappy, clean-cut freshness and the design reflects strength of character and construction. Across the front extends a wide open front porch holding forth a warm welcome. The entrance is at one side by means of concrete steps. About mid-way is the front door opening into a fairly large living room, on either side of which are small half windows with fireplace.

Between the living room and dining room which is directly to the rear is a colonnade, a type of inter-room opening which is popular with many homeowners. The dining room is about the same size and has a large triple window. It, in turn, is connected with the kitchen by a single swinging door. The kitchen is quite small, modeled along efficiency lines, and has several built-in cupboards and pantry adjoining. In the wall of the pantry facing the back porch is an outdoor icing refrigerator.

On the other side of the house are two bedrooms

and bath, the former 13 by 11 and 11 by 11 feet. The rear bedroom opens out onto a rear sleeping porch fitted with folding casement windows.

The house over all measures 25 feet in width and 44 feet in length, far from being a large structure yet ample for its requirements because of the efficient arrangement of the rooms. The important thing, one



Floor Plan of Brick Bungalow, 25 by 44 Feet.

which interests the man who is building, is its freedom from expensive frills and lines that will increase his costs. For all-round service, permanency, and appearance, this home is among the leaders of its class.



Well-Built Brick Bungalow of Five Rooms and Sleeping Porch. The Large Front Porch with Its Substantial Brick Pillars and Banners Is a Practical Feature That Will Appeal to Most Families.

Why Pat Switched to Ideal Wall Construction



"Shure, and I used to build frame houses," exclaimed Pat. "Do you want to know how I came to switch over to Brick? Well, I'll tell you.

"You see it was like this. When automobiles came along, my friend Casey, the blacksmith, said, 'I'll have nothing to do with the dummed things.' And he didn't; and Casey died in his tracks.

"But while Casey tried to buck progress, the fellow across the street built a garage and made lots of money.

"Now, I'm not going to be old-fashioned and hang back like Casey did, so when I heard about this new Ideal Brick Hollow Wall, which brings the cost of brickwork down to frame, I grabbed it quick."

Pat hit the nail on the head—the world moves fast. He wasn't going to stand in his tracks and let the parade pass. He got busy building according to the new Ideal Brick Hollow Wall construction, and he found it one of the greatest money-makers that he had ever run across. Read, in the next column, about this type of construction.

The Common Brick Industry of America

1306 SCHOFIELD BUILDING

Cleveland, Ohio

The Ideal Brick Hollow Wall

Ideal Wall Quick and Easy to Lay

Builders everywhere are switching to the Ideal Brick Hollow Wall construction. They realize their opportunities. They're getting in on the ground floor. They're quick to sense the ever increasing demand for this construction as it becomes better known.

There's nothing complicated about the Ideal Wall. Standard size brick are used and laid on edge into walls of 8-inch, 12-inch and 16-inch thicknesses. Exhaustive tests and actual experience prove the merit of this construction.

It opens up a big field for the mason builder, because it means a vastly increased amount of brickwork. Consider the number of jobs you can get when you show that you are able to produce good, durable, fire-safe, attractive brickwork for the cost of less attractive and less endurable construction.

Complete Facts Contained in This Book

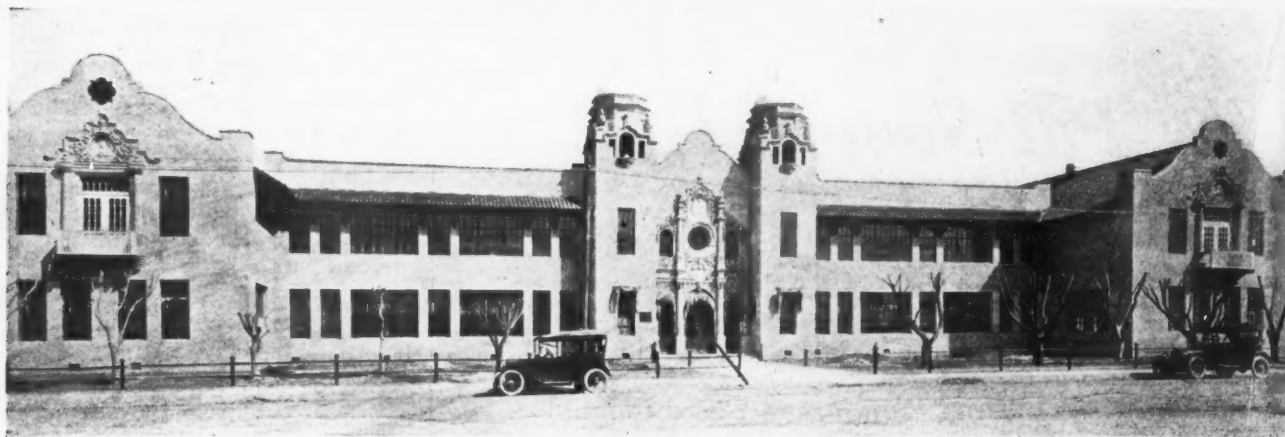
Send for "*Brick, How to Build and Estimate*," third edition. This is a 72-page manual of fullest data on Ideal and solid brick construction, containing vital information for contractors. It covers such necessary items as strength of brick, mortar, and finished brickwork; valuable hints on practical brick construction; equipment for the contractor; complete estimating tables showing quantities of brick, material for mortar of any mix, bricklayers' and laborers' time worked out for various thicknesses and square foot areas of Ideal and solid brick walls up to 10,000 square feet; and much other useful information. 9 detail plates, 30 tables, 57 illustrations. A 72-page construction manual for 25 cents prepaid.

This Book of Designs Will Help You Get Business

"*Brick for the Average Man's Home*" is a book of new and original designs for two-story houses, story and a half houses, bungalows, cottages, and two-apartment buildings. Exterior view, floor plans, and description of each design given. Working drawings are available for each design. 72 pages, beautifully illustrated. \$1.00 prepaid. Send \$1.25 to the Common Brick Manufacturers Association, 1306 Schofield Building, Cleveland, and receive both books.



The Ideal Wall opens a big field for the mason builder



Beautiful School of Mission Type at Tucson, Ariz., with Walls of Steel Sash Thruout.

Building Schools That Are Safe

HOW MODERN SCHOOL HOUSES ARE CONSTRUCTED TO PREVENT LOSS OF LIFE FROM FIRE AND TO INCREASE COMFORT OF PUPILS

"It shall not happen again."

That is what we all said seventeen years ago this time when the Iroquois theater of Chicago exacted its toll of 700 human lives, mostly women and children.

That is what we repeated ten years ago when the terrible fire at the Collinwood school in Cleveland burned with its appalling death list of children.

"It shall not happen again."

And there is every reason to believe that it will not—at least not in new school buildings. The construction of school houses today has become one of the most interesting studies of the building art. In building homes, people scrimp and cut to save expense. But



Library of Leland Stanford University, Palo Alto, Cal., Equipped Thruout with Steel Sash. Note the Wonderful Lighting Effect from Side and Ceiling.



Counterbalanced Steel Sash in High School, Highland Park, Mich. This Is a Splendid Sash for School Buildings.

when the new school building is being planned there should not be any thought of expense. The big question should be always, "Will it be safe?"

"There was a time," says a writer in the School Board Journal, "when the architect yielded with humility to the crude whims and notions of a school board. He wanted the job. Moreover he was not fully equipped to combat false conceptions of architecture.

"But the transformation has been



You Are Asked to Plan And to Prepare Estimates On Building This House *Can You Do It?*

If you **can't** plan, estimate and handle building jobs from start to finish, you are not yet in the real money making class—you are not a building expert.

But, you can become an expert simply by giving some of your spare time to home study under the direction of the Chicago "Tech" experts who will train you in any important branch of building which you may want to take up. In this way, you can profit by the experience of men who know every branch of building "from the ground up." You can make your services worth more money because you can acquire the knowledge which commands the highest pay. All this at little cost and on easy terms.

No need for any man to remain in a position which offers little or no chance for advancement or more money. There is always a market for brains. The man who knows more than the average—the man who has a special kind of knowledge—the man who knows the best way to get a certain kind of work done is the man who makes the real income today. And Chicago "Tech" is giving ambitious men that kind of knowledge—putting them where they get more because they are worth more.

Boom in Building Coming—Get Ready to Profit by It

Get this training now and your opportunity will come. Building is to be resumed and there will be a big demand for men able to take charge of important work; also chances for the man who wants to go into business and for the small contractor to extend his business.

Complete Courses for Men in Building Trades

Chicago "Tech" Courses are planned for practical men who want to become better informed on subjects which apply to their daily work. No time is given to "fancy" studies or useless theories. The man enrolled with Chicago "Tech" handles the actual problems he meets every day—and every point is made clear by our experts.

Some of the Subjects We Teach

Plan Reading. How to read a building plan. How to read dimensions. How to read detail drawings. How to lay out work from plans. How to stake out buildings. Practice in reading complete blue print plans from basement to roof, etc., etc. Many complete sets of blue print plans and specifications are furnished to the student.

Estimating. Figuring amount and cost of material. Estimating time and labor. How to figure carpenter work such as stairs, roofing, rafters, etc. Millwork, window and door frames, mouldings, cornices, etc. All about the steel square. Lathing and plastering. Excavating. Brick, stone, and concrete work. Fire-proofing. Glazing. Plumbing. Heating. Wiring, Etc., Etc.

Superintending. Methods of work on all classes of buildings. Uses and preparation of all kinds of material. Hiring and handling men.

Also **Special Courses in Architectural Drafting for Carpenters and Builders** and in **Plumbing** and **Heating and Ventilating**,—all taught by practical men.

Send the Coupon

Don't delay. At least find out about this practical training for bigger pay or more profits. You incur no obligation in asking for this information and the Free Trial Lesson. We gladly send it free for we want every man in the building trades to know what Chicago "Tech" offers in practical training. Mark X in the coupon to show which course interests you.

CHICAGO TECHNICAL COLLEGE
136 Chicago "Tech" Bldg., Chicago, Ill.

You Can Learn by Mail



FREE Trial Lesson

This Free Lesson in Plan Reading shows how easily you can grasp the subject by the Chicago "Tech" method. Nothing to pay for this lesson: we send it to show how you can advance by taking a Chicago "Tech" home study course. Coupon brings the lesson and also full information on how we train men by mail giving them practical instructions which means more money. Not a penny to send—this lesson is free.

CHICAGO TECHNICAL COLLEGE.
136 Chicago "Tech" Building, Chicago.

Without obligation upon me please send Free Trial Lesson and information on the course I have marked X below.

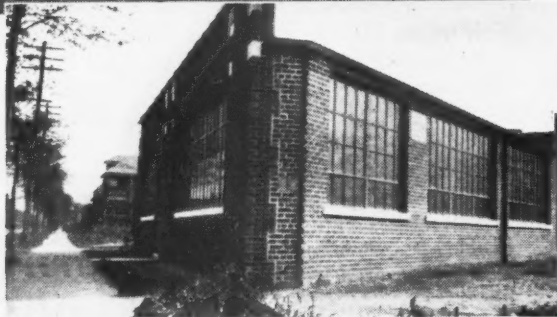
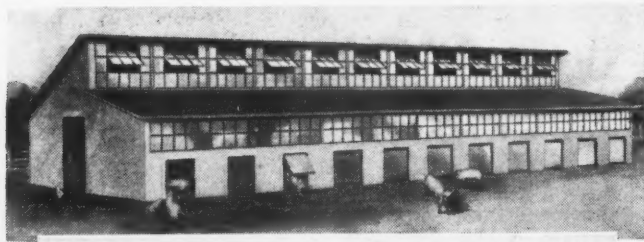
- ☐ Plan Reading and Estimating
☐ Architectural Drafting

Name.....

Address.....

Post Office..... State.....

Occupation



For Small Buildings

THE FACT that Fenestra Window Walls cost less than wood windows appeals to those who put up even very small buildings.

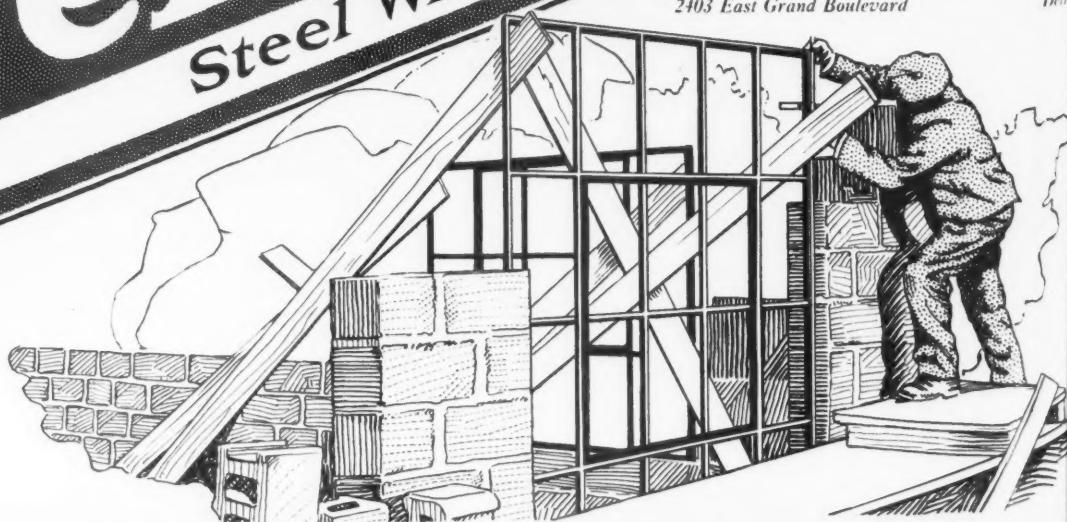
Private garages, stores, creameries and frequently farm buildings are now designed with the big steel windows because they save money both in initial cost and in upkeep. They also provide more light, ventilation and fire protection—are easily and quickly installed and never warp or stick.

Dealers anywhere can get them for you almost over night from one of our 24 warehouses.

Fenestra

Steel Window Walls

Detroit Steel Products Company
2403 East Grand Boulevard
Detroit





ask your Dealer For Prices

10% to 25% saving to the builder is not at all uncommon where Fenestra steel windows are used in place of wood.

That's true, even on very small buildings.

And Fenestra is much easier to handle, because each window arrives ready to set right in the wall. No extra frame is needed—no fitting and hanging of sash, no weights, no cords. It is even painted before shipment.

You can get a choice of 34 types and sizes through your own dealer in your own town. If by chance he doesn't know about them we will appreciate your asking him to write us.

We have a new booklet which tells how to install Fenestra in all kinds of buildings. It will be a pleasure to send you a copy free, if you will fill out the postal card which accompanies this advertisement.

Detroit Steel Products Company
2403 East Grand Boulevard Detroit



How to "Get More For Your Money In Windows"

Detroit Steel Products Company
2403 East Grand Boulevard Detroit

I am interested in "Getting more for my money in windows."
I buy building materials from

(give your local dealer's name and address)

Please send me your free books showing how your "WindoWalls" are installed and why they cost less than wood.

Name _____
Address _____



This Modern School Building Is Located in a Town of Less Than 2,000. Small Town Builders Believe in Plenty of Daylight and Ventilation, as Shown by the Large Area of Steel Sash in This Building.

Building Schools that Are Safe

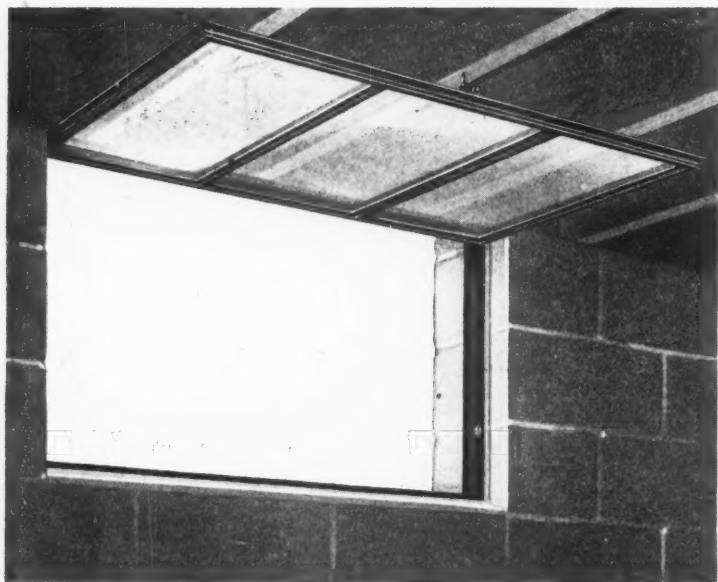
(Continued from page 118.)

both radical and gratifying. The modern school architect has lent himself to the most daring departures. Permitted to indulge in experimentation and innovation, he has boldly introduced the new and discarded the old.

"As a result the American school architecture is the most attractive and most serviceable of its kind in the world."

Among the most striking of the new and serviceable features that have been introduced is the steel sash window wall which not only increases the light area and ventilation but adds to the fireproof qualities of

**At last—A steel basement window
— that costs less than wood —**



100% more daylight for the basement

TRUSCON
STEEL BASEMENT
WINDOWS

Home builders have always wanted an indestructible basement window like this.

A steel unit ready to install—no fitting of sash to a frame—no hinges and locks to buy—the Truscon Steel Basement Window is fully equipped. There are no extras. Double contact weathering makes it storm proof. It works just like ordinary sash.

Throw in the coal and wood—it does not hurt these rugged, steel, indestructible windows.

—And they actually cost less than wood.

*Get figures before you build
your next house*

Truscon Steel Company, Youngstown, Ohio
There are Truscon Dealers Everywhere



install **Brasco** COPPER STORE FRONTS

**WRITE FOR
FREE BOOKLET**

*"How to Sell and
Figure Brasco Fronts"*



Will outlast them all

THIS is a pleasant occupation that pays big money and one that any good carpenter or contractor can easily handle.

There is plenty of store front business right in your town and we will help you get it.

If you know of a front that should or will be remodeled get in touch with us at once and we will give you estimates and information necessary for landing the contract. At any rate, write for our literature on the subject and look the field over.

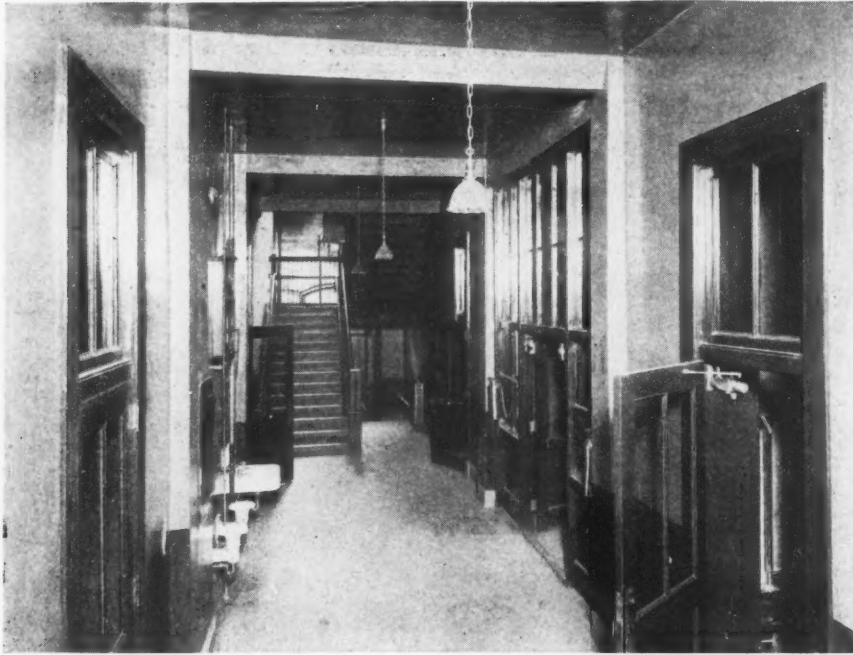
Thousands of other men are making good money in this business. **USE THIS COUPON NOW!**

BRASCO MFG. CO., 5029 S. Wabash Ave., Chicago

Gentlemen—Please send me catalog and full details of your special offer.

Name.....
City.....
State.....

Providing Maximum Light and Safety in School Houses



Fireproof Corridor and Stairway in Bayard School, Pittsburgh, Pa. All Openings, Including Class Room Doors, Frames, Smoke Screens, Transoms, etc., Are Hollow metal.

the building. It supplements the steel, metal and hollow metal doors and trim which are now used extensively in new buildings. Steel transoms fitted with wireglass and heavy metal doors form an effective fire barrier. Fire doors between sections of the building are ready to be swung into place once the alarm is

sounded. Thus if the fire starts in one end of the building it can be confined to a small part while the pupils in the rest of the school are led thru fire safe corridors to safety.

Steel sash has been used so effectively in factories that it has been adopted in many communities for school buildings. The architect is not limited to any one type as this sash is made in a variety of styles as outlined in a recent number of the *AMERICAN BUILDER*. The strength of the sash enables the architect and builder to use more window space in the walls and less masonry, insuring plenty of light and ventilation that is easily controlled. The design of the sash permits straight lines which do not detract from the dignity and character

of the building while adding fire resistant qualities.

A system of distribution has been worked out by the manufacturers of this product whereby it can be placed in the hands of the builder as quickly as other standardized material.

SAGER METAL WEATHER STRIPS

Give your dollar a chance to make good. Get the best that money will buy. The market for the best products that are made consists of the people who HAVE TRIED THE OTHER KIND and who know that it pays to pay the right price first, at the time of purchase, instead of paying much more during the period of use.

You will make a big hit with your

customers if you will PROTECT the value of their dollars by sticking to the value of QUALITY. Dollars and quality help the world to make good. Dollars invested in something cheap are beaten before they've had their chance. The greatest bargain that the world ever offered to humanity is QUALITY.

SAGER WEATHER STRIP is the QUALITY strip.

Some good territory open for live agents

SAGER LOCK COMPANY

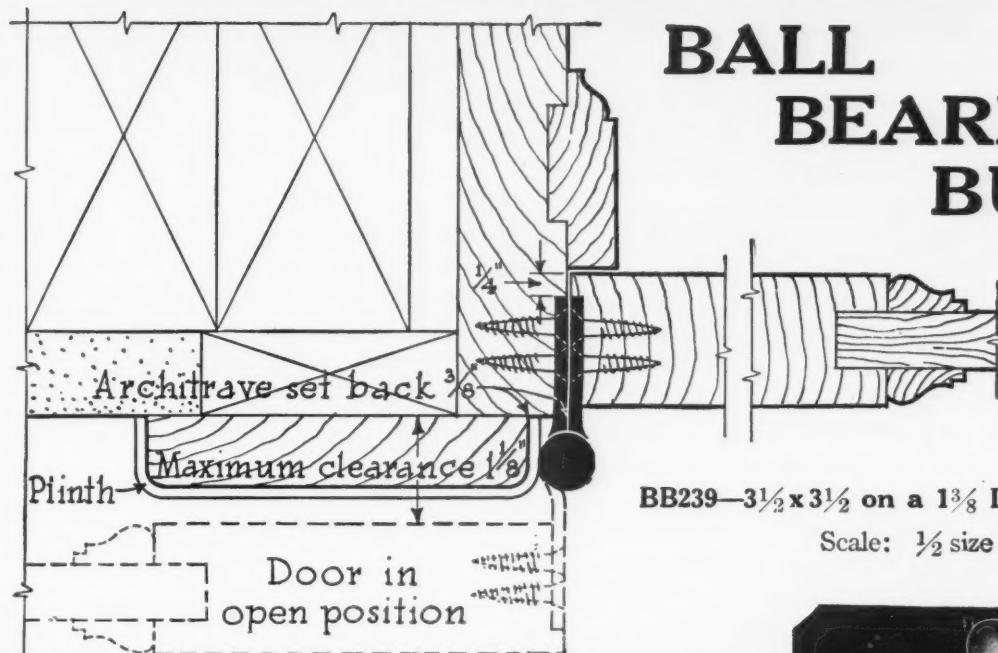
NORTH CHICAGO

(Established 1880)

ILLINOIS

STANLEY

BALL BEARING BUTTS

BB239— $3\frac{1}{2} \times 3\frac{1}{2}$ on a $1\frac{3}{8}$ Door of WoodScale: $\frac{1}{2}$ size

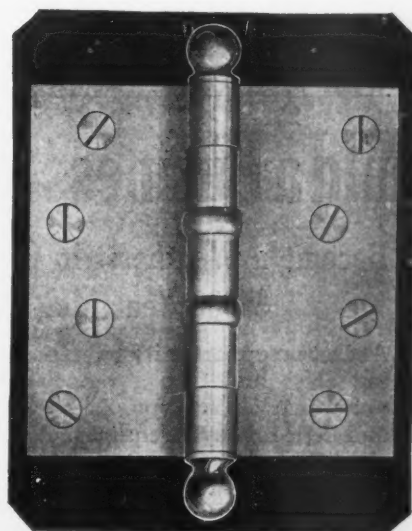
DATA:

As a base for lasting high finish, a heavy plating of copper is deposited on polished cold rolled steel, and an additional heavy plating of finish required is placed upon copper base.

Equipped with Stanley non-detachable, weather-protected ball bearing washers. Ball tips have square shoulders flush with knuckle. Ball tip and pin are made in one piece. Pin has the Stanley non-rising and self-lubricating features. This method of lubrication prevents wear on inside of knuckles. Edges and joints are ground perfectly true. Closely fitting joints are obtained by inner edges of leaves being beveled.

Class number (BB239) is stamped upon the back of butt, at top of leaf and near joint.

Stanley Shearadized finish (designated by the letter "Z" stamped on leaf near joint) is recommended for exterior use and can be furnished in any plated finish desired.



No. BB239 is Made in the Following Sizes and All Finishes:

| | | |
|------------------------------------|------------------------------------|-------|
| $2\frac{1}{2} \times 2\frac{1}{2}$ | $3\frac{1}{2} \times 3\frac{1}{2}$ | 5 x 5 |
| 3 x 3 | 4 x 4 | 6 x 6 |
| | $4\frac{1}{2} \times 4\frac{1}{2}$ | |

"THREE BUTTS WILL PREVENT THE DOOR FROM WARPING"

Tear off this page and file for reference.



THE STANLEY WORKS

NEW BRITAIN, CONN.

New York

Chicago

San Francisco

Los Angeles

Seattle

Atlanta

Manufacturers of Wrought Hardware
and Carpenters' Tools

One Way to Promote All-Year Building

A SUGGESTION worthy of the attention of all members of the building industry has been made in the December sales bulletin of David Lupton's Sons Co. It has to do with the problem of all-year building.

The seasonal nature of building has been the chief obstacle in the way of continuous program.

"Since it costs a little less to build in summer than in winter," says this article, "owners incline to let contracts in the early spring. This leads to a natural preference on the part of labor for making wage agreements after contracts have been set, usually May 1. The resultant uncertainty makes both the owner and contractor hesitate to sign contracts until wages have been fixed, thereby intensifying the seasonal tendency.

"The result is that labor is largely idle during the winter, contractors must earn their overhead during the summer, hence it is hardly strange that employers and laborers feel that self-protection requires them to do things which do not commonly occur in industries whose workers have fixed jobs, fixed homes and some understanding of their employers' needs.

"Not only do contractors and workers find themselves burdened with the high costs of seasonal employment but the material manufacturers likewise must choose between manufacturing for stock during the dull months and laying off part of their help.

"All this is due to the difference in cost in con-

struction between winter and summer. *If that cost could be equalized* to the owner so that he could start building at any season, without added expense, *building would immediately become an all-year occupation.* The employer would keep his men, the men their jobs, the peak cost of summer construction would be leveled and everybody would be the gainer.

"This condition could be brought about by a joint agreement of material makers, labor, and building contractors to maintain a graduated scale of prices, wages and profits with just enough difference between the winter and summer scales to offset the difference in cost of building.

"Ways are frequently found to reduce this difference in cost; but whether it be high or low, any difference necessary in scales would be preferable to chronic winter unemployment."

We shall be glad to receive opinions from our readers as to the practicability of this suggestion. Certainly it strikes at the heart of the most important problem of the building industry and should provoke more than passing thought among all members of the industry.



THE first motor truck in the lumber industry is said to have been used in 1904 by a wholesale sash and door company in Boston, Massachusetts. That year there were only 694 trucks of all kinds produced in the United States, compared with 316,364 in 1919.

Build a Business for Yourself

Become a Weatherstrip Contractor-Agent \$5000 Year Men Needed

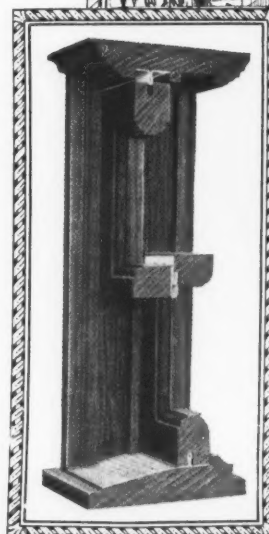
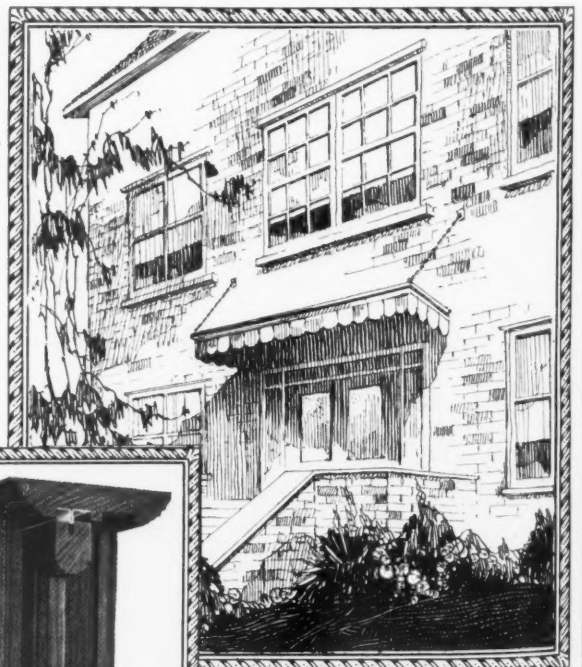
At last an opportunity to step out of the wage earning class and into a money-making business of your own awaits you. You need no experience and little money is required. You will make money right from the start. Some of our agents are making \$5000 per year. All are making a good living.

An All Year Business

Every building that goes up and every one already built is ready to be equipped. Builders and home owners are beginning to appreciate the coal-reducing costs, the cleanliness and the comfort resulting from the use of weatherstrip. There are new buildings in the Spring, Summer and Fall and old buildings in the Winter to be equipped. So now is the time to start. Our beautiful folder, "Installations," will be a revelation to you—showing the popularity of Allmetal Weatherstrip. Let us send it to you together with our selling plan.

We assist you to land contracts—Write us

ALLMETAL WEATHERSTRIP COMPANY
128 West Kinzie Street, Chicago



at cost
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build-
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ir jobs,
leveled

a joint
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The "Master" Woodworker

**Cuts Your
Rough
Stuff Like
Whirlwind**

**Model
No. 7**

A Great Labor Saver

**A Guaranteed Saving of \$400.00
per month in Labor Costs**

*The motor rides
on ball bearings,
insuring ease of
operation. The
motor is con-
nected direct to
mandrel — no
power lost in
complicated*

*transmissions—the cost of elec-
tric current is infinitesimal. No
matter what you are doing the
lumber always runs in the
same direction. Machine can
be used in a hallway, when
necessary, and two men work
at the same time.*

**A Master Woodworker
does all the hard work.**
*Will rip 4 inches thick without over-
load. No power wasted on countershaft.*

Can be run from any lamp socket on ordinary house circuits

*Underslung rip saw, Overhead
cross cut that works like a swing
saw. Doors, miters, dados, rab-
bets, planes, moulds, ribs and
joints on the bevel, makes jack-
rafters, fire cuts, houses
stair strings, and every
other cut neces-
sary in building.
Built to last a
lifetime, stur-
dy and won-
derfully ac-
curate.*

*Two
men can
carry it.
Power-
ful, goes
through a
2' 6" door.
8,200 in
daily use in
U. S. A.
Patented
November
24, 1914—1920.*

"BACK TO 1913 PRICES"

This machine cuts on the principle of a swing saw. The work being stationary, it does not take two men to shove the long planks through. It is an absolutely safe cross cutting machine. Will cut 24 inches wide, 2 3/4 inches thick, with a 10-inch saw and 4 inches thick with a 14-inch saw. Both saw and table can be raised up or down by gears, absolutely square with the saw.

WILL RIP ANY LUMBER — WET OR DRY

The Table is kept firm and steady on the machine by a locking device that assures absolute accuracy in cutting.

Graduated dial permits saw to be set accurately while running. Connect from any lamp socket.

POWERFUL — DRIVEN BY SPECIAL MOTORS

A jackrafter can be cut by setting the slide at an angle and fitting table or using Jointer Fence, the cut made in one operation. A perfect machine for housing stair string; a pair of 16-inch stair strings can be housed in forty minutes.

Cross Cutting—In cross cutting overhead mandrel, slide and motor swing around over table at any angle. The saw travels at any angle, saw or dado pulled through the lumber which remains stationary.

By loosening 4 bolts it divides into 4 parts, taken right on the job the heaviest part of which is less than 200 pounds.

Routing and cutting off a side door jamb can be made in one operation by putting on saw a 1-inch collar and a 3/8-inch dado on overhead mandrel. The door jamb can be cut to length and dadoed in one operation. Will pass through 2' 6" door for inside finishing.

The finest trim or the roughest heavy work may be handled with equal speed and accuracy; cuts absolutely true; will cut the finest veneers without chipping.

ACTUALLY PORTABLE

This machine is equipped with a sliding table (working back and forth on gibs) and a boring chuck which takes any carpenter bit after cutting off the square shank, leaving a round shank which will fit the chuck on this machine.

Forty-six hundred holes 3/8-inch in diameter can be bored per hour by putting several boards together.

MAKE IT PAY FOR ITSELF — SOLD ON

With the heavy underslung mandrel on this machine, various sizes of dados fitted with moulding knives of any shape can be used. By using rip saw with dado, any form

ITS MERITS — FIVE YEAR GUARANTEE

moulding can be ripped in one operation, and all kinds of panel moulding can be cut out of waste lumber; also panels and newel posts can be made.

6-6 RIPPING BELT

Cuts moulding of any shape. No counter-shafts. No vibration. Delivers its power to the tooth of the saw.

the table eliminating all vibration. All machines equipped with a 6" jointer 42" long. Work in sight at all times.

In making mouldings, the dado knives are always running toward the lumber, and keeps the lumber steady on

This machine can also be equipped with emery wheel for sharpening tools.

"The Only Portable Woodworker That Can Be Taken From Job To Job" (Inside the Building)

Made of the best materials, careful and accurate in workmanship.

Machine and tools fully guaranteed — Complete satisfaction or money refunded.

FURNISHED WITH REGULAR EQUIPMENT AS FOLLOWS:

The regular equipment consists of an Emerson, 2 horsepower continuous duty, alternating current, or General Electric, 2 horsepower direct current continuous duty, 110-220 volt motor, 12-inch cross cut saw, 14-inch rip saw, 3/8-inch and 1/2-inch dado head, 2 side cutters, self-centering chuck, wrench, oil can, belts, 25-foot portable cable, and knife switch, and 6" jointer 42" long. Make it pay for itself as you are paying for it!

No. 7—Model Complete with Regular Equipment as above, length over all 5 feet, width over all without table 2 1/2 feet (will go through a door of 2 1/2 feet by folding the brackets), weight about 700 lbs. Price on Request. Sold with or without Band Saw.

MANUFACTURED BY

THE WOODWORKER MANUFACTURING COMPANY

CORNER BRUSH AND CONGRESS STREETS

DETROIT, MICHIGAN

Cleveland Building Show Postponed

FAILURE of the city to have its new \$6,000,000 auditorium ready in time has caused the postponement of the American Building Exposition, Cleveland, from January 4th to February 22nd. It will cover a period of eleven days, terminating March 4th. Home, commercial and factory building and equipment will be furnished.

The application of every sort of building material will be demonstrated. The Cleveland Institute of Architects will supply an extensive architectural exhibit. There will be landscaping exhibits to illustrate what can be done at small cost toward beautifying the grounds. All of the latest improved modern equipment for reducing the burdens of the housewife will be shown.

One floor of the exposition has a ceiling height of 60 feet and thereon will be built half a dozen completed cottages in wood, brick and stucco. The largest exhibit on this floor, staged by the Cleveland Board of Lumber Dealers, will represent an outlay of more than \$25,000.



Blaw-Knox N. Y. Office Moves

THE New York office of the Blaw-Knox Company has moved from the City Investing Building to the Carbide & Carbon Building, 30 East Forty-second Street.



S. C. Johnson Annual Convention

EMPLOYEES of S. C. Johnson & Son, Racine, Wis., gathered in their annual sales convention during the week December 12-17. An extensive business and social program had been arranged and at the annual dance, attended by all employees and their families, a bonus of \$76,810.64 was distributed among 243 employees in proportion to their length of service and salary or wages received during the year.

Southern Pine Association Appoints Advertising Man

ALBERT R. ISRAEL, New Orleans newspaper man, has been appointed manager of publicity of the Southern Pine Association, and will assume the duties of this position immediately.

For more than a score of years Mr. Israel has been engaged in daily newspaper work all over the United States and has a wide acquaintance in that profession. For five years he was manager of important bureaus of the Associated Press in the South, became editor-in-chief of the Shreveport, La., Times in 1918, and returned to New Orleans in August, 1919, as a special writer on the New Orleans States, which position he resigned some weeks ago in order to take a rest.

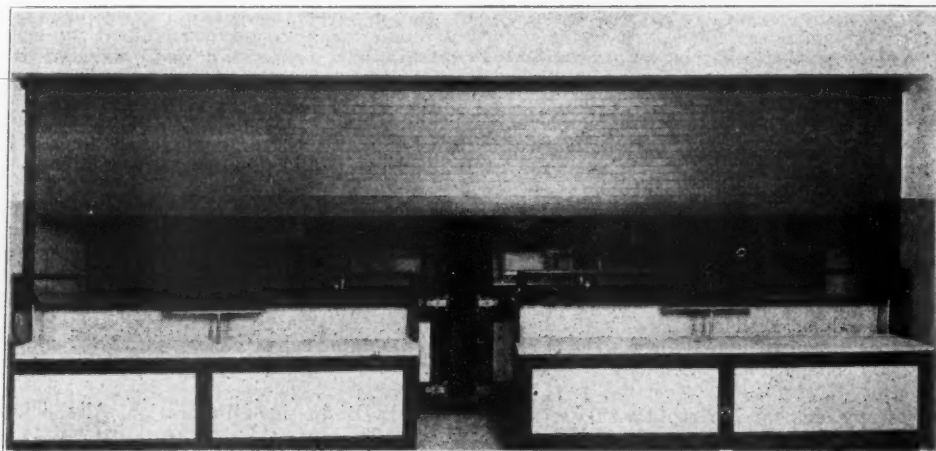
During his career Mr. Israel has held responsible positions on leading daily newspapers in large cities of the country, besides having been Washington correspondent at different times for Western and Canadian newspapers, special writer for feature syndicates and contributing to various magazines. Some time ago he did some special publicity work for the Southern Pine Association which enabled him to familiarize himself somewhat with the lumber industry and its interests.



Kiln Drying Course for Home Study

SINCE the announcement of the correspondence-study course Kiln Drying of Lumber by the Extension Division of the University of Wisconsin less than two years ago, almost 400 persons have enrolled. This course has been developed thru co-operation with the U. S. Forest Products Laboratory. Men from thirty-seven states of the Union and seven foreign countries have taken up this mail instruction to learn more about the art of operating dry kilns, and the

WOOD ROLLING PARTITIONS



Showing rolling partition over 20 feet wide recently installed in Public Market, Dayton, Ohio

Swedish Pine being used in our Imported Rolling Partitions, no wood is so well adapted for this purpose, for while it is tough and durable, it is also flexible. The slats are made of selected straight grain pine, and strung on material that performs its functions under all atmospheric conditions. The partitions are operated by even-balanced spring roller, made of Swedish Steel, specially tempered for this purpose, and they move in deep channel grooves

placed on both sides. Locks can be placed at the bottom, if necessary, so that the partitions can be locked down.

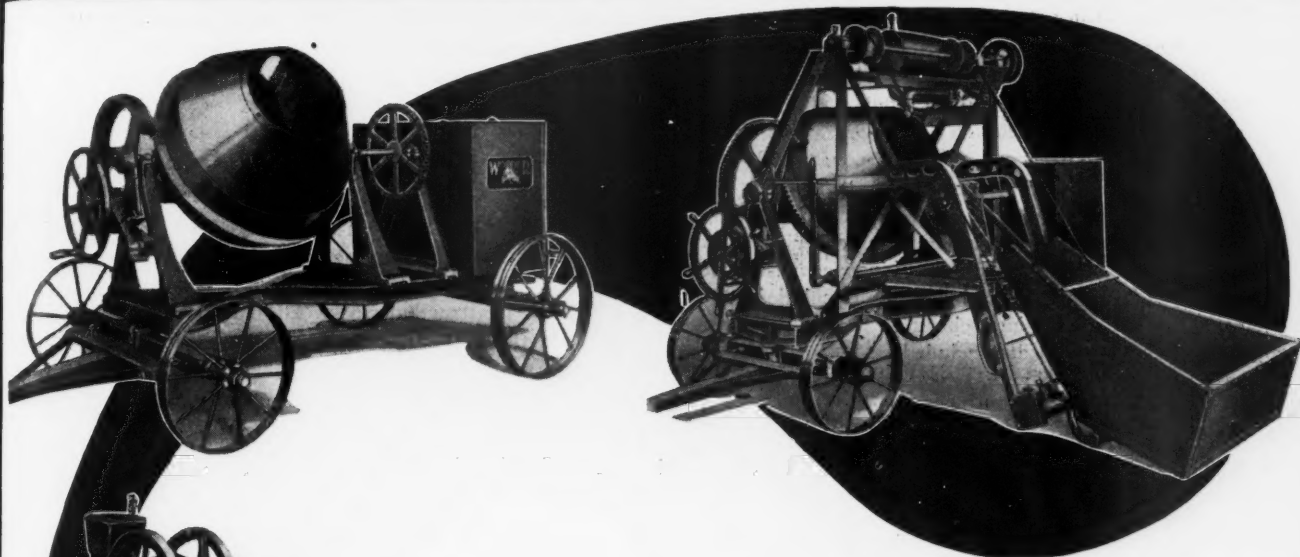
Our Partitions come in the white wood, their natural state. The finish of the partitions is best done after it has been erected.

It is considered by the users that these Imported Partitions are superior to any on this market.

Particularly suitable for churches, hospitals, schools, markets, etc.
Write for detailed information

Swedish Venetian Blind Company, 1265 Broadway, New York City

Manufacturers of Steel Shutters, Venetian and Roller Blinds



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CONSTRUCTION MACHINERY COMPANY

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proper handling of lumber in general.

This correspondence-study course is an outgrowth of the resident short courses which have proved so successful at the U. S. Forest Products Laboratory, located on the University campus. Many men who cannot avail themselves of the class instruction in Kiln Drying given at regular intervals enroll for the correspondence-study course and so obtain valuable information upon the latest developments in the seasoning of wood.

The course consists of ten assignments covering the structure of wood, moisture content, shrinking and casehardening, various types of kilns, heat, humidity, circulation, and the operation of kilns. Drying schedules for all of the more common kinds of wood are included.

The Extension Division of the University of Wisconsin, Madison, will gladly supply information on request.



Exposition Announces Home Design Competition

THE Landscape Committee of the Chicago Own Your Home Exposition, Mr. Ralph R. Root, chairman, announces a competitive design for the grounds of a small city or suburban home, the competition to be open to both professionals and amateurs. Awards will be offered for the first four designs selected by the jury as a partial compensation for the service rendered. The winner of first place will receive \$75.00; second, third, and fourth place will be awarded \$25 each. The jury is made up of one architect and two landscape architects, the members being: Mr. Edward H. Bennett, Mrs. Francis P. King, and Mr. Noble Hollister. The competition program was drafted by Chance S. Hill, professor of landscape design, department of landscape gardening University of Illinois. The contest closes at noon, Wednesday, February 15, 1922, and the details of the problem on which

the designs must be based together with the conditions governing the contest may be had on application to Robert H. Sexton, Managing Director, 'Own Your Home Exposition, 15 East Van Buren street Chicago.



Secretary Hoover Holds Conference on Construction Contracts

SECRETARY OF COMMERCE HOOVER recently held a conference of constructors, architects and engineers to consider the adoption of standard contract forms for all classes of construction work. The meeting has been called to consider the suggestion of the Hoover Report on the Elimination of Waste in the Building Industry, that present contract forms need revision.

Those who attended the conference were: Wm. Stanley Parker of Boston, Secretary, American Institute of Architects; W. D. Faucette of Norfolk, Va., Chief Engineer, Seaboard Air Line, representing the American Railway Engineering Association; H. Eltinge Breed of New York, representing the American Society of Civil Engineers; J. Waldo Smith, Chief Engineer, New York Board of Water Supply, representing the American Water Works Association; A. P. Davis, Director, U. S. Reclamation Service, representing the American Engineering Council; Mr. Onward Bates, Consulting Engineer, Chicago, Ill., representing the Western Society of Engineers; J. W. Cowper, President, John W. Cowper Co., Buffalo, N. Y., representing the Associated General Contractors of America; E. W. Reaugh, President, Reaugh Construction Co., Cleveland, O., representing the National Association of Builders' Exchanges; H. K. Bishop, U. S. Bureau of Public Roads, Washington, D. C.

The purpose of the conference is to select the general principles applicable to all kinds of construction, and the special



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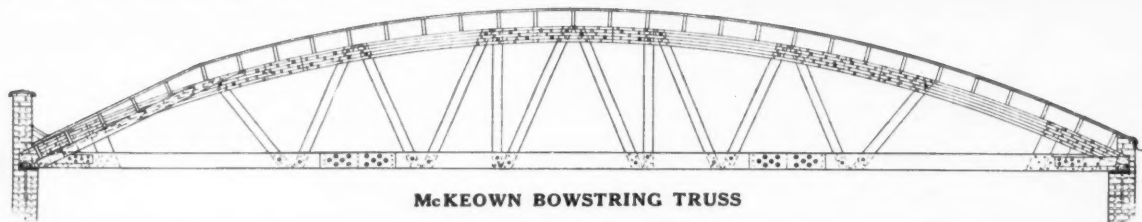
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provisions complementary thereto but applicable only to individual classes of work and from these (1) to create a Universal Document which will contain standard provisions for all classes of construction work and (2) to establish individual standard contract forms for each type of construction, such as have been developed for building by the American Institute of Architects and for railroad construction by the American Railway Engineering Association.

The accomplishment of this purpose, it is hoped, will result in:

(1) Less expenditure for legal services in drawing proper contracts, and the elimination of disputes over contracts already drawn.

(2) Less duplication of work in the profession attendant on construction.

(3) Better safeguard for owners and increased public confidence, and

(4) An improved standard of construction service throughout the country.



THE Structural Service Bureau, an organization for increasing safety, efficiency and productivity in the building industry, thru a better understanding of materials, equipment and devices, has removed from the Estey Building to the Otis Building, 112 South Sixteenth Street, Philadelphia, Pa. D. Knickerbacker Boyd, Victor D. Abel, Francis A. Gugert, A. Lynwood Ferguson, and associates, comprise this bureau.

How many board feet in 96 pieces of 2x4--14?



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896

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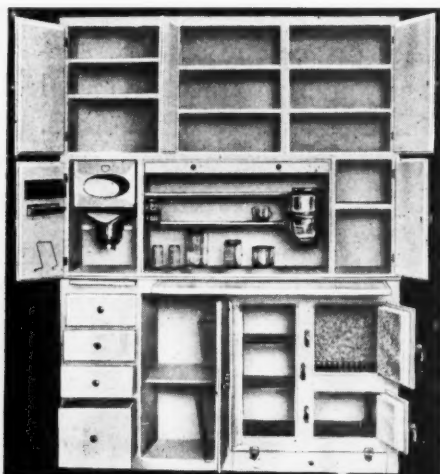
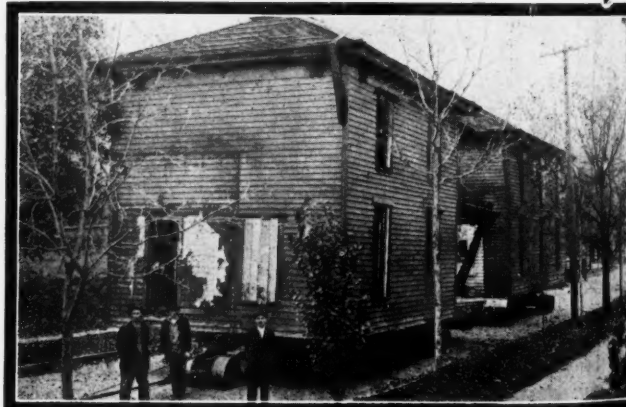
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and a little extra equipment you are in a position to tackle the hardest jobs. Made of steel—last a lifetime—no repairs—no upkeep expense—move a house a mile a day.

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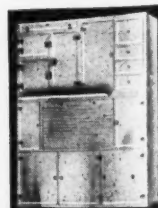
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Made either RIGHT or LEFT hand, cut shows right hand, and for FRONT, REAR, or END icing. REAR or END parcel and garbage service. Can be BUILT-IN or SET-IN and includes 60-lb. ice capacity refrigerator together with all the conveniences of the ordinary kitchen cabinet, and has extra large storage capacity. Entirely inclosed with lap front sanitary doors and roll front. Beautiful white enamel finish exterior and interior.

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